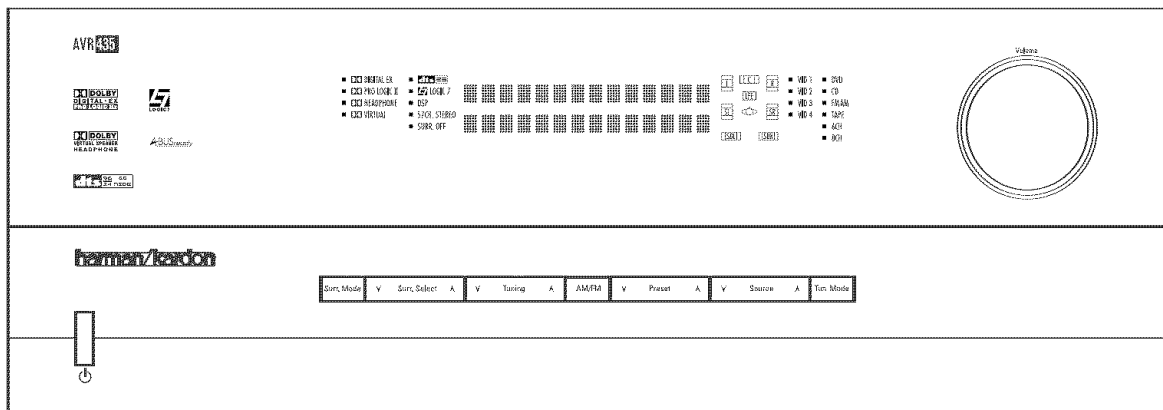


harman/kardon®
 Power for the Digital Revolution.®

AVR 435

AUDIO/VIDEO RECEIVER
 OWNER'S MANUAL



AVR 435 AUDIO/VIDEO RECEIVER

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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.

Typographical Conventions

In order to help you use this manual with the remote control, front-panel controls and rear-panel connections, certain conventions have been used.

EXAMPLE – (bold type) indicates a specific remote control or front-panel button, or rear-panel connection jack

EXAMPLE – (OCR type) indicates a message that is visible on-screen or on the front-panel information display

EXAMPLE – (Synchro type) indicates a message that is displayed on the remote control's LCD screen

1 – (number in a square) indicates a specific front-panel control

A – (letter in a square) indicates a front-panel control that is normally concealed behind the drop-down door

1 – (number in a circle) indicates a rear-panel connection

1 – (number in an oval) indicates a button or indicator on the remote

A – (letter in an oval) indicates a button on the Zone II remote

The appearance of the text or cursor for your receiver's on-screen menus may vary slightly from the illustrations in this manual. Whether the text appears in all uppercase or upper- and lowercase characters, performance and operation remain the same.

Thank You for Choosing Harman Kardon®

With the purchase of a Harman Kardon AVR 435, you are about to begin many years of listening enjoyment.

The AVR 435 has a wide range of features and options that accommodate virtually any combination of speakers, room size and program sources. It is as easy to operate as it is to set up, but in order to take maximum advantage of the many advanced technologies within your new AVR, it is strongly recommended that you take a few minutes to read this owner's manual.

If you have any questions about this product, its installation or its operation, we recommend that you contact your dealer or installer, as they are your best source of local information. You may also access a wealth of information and assistance by visiting our Web site at www.harmankardon.com.

Description and Features

The AVR 435 is designed to serve as the hub of your home entertainment system, combining the flexibility to access the wide range of audio and video source options available today with the power to handle virtually any type of program material or surround mode. Thanks to a state-of-the-art DA610 digital signal processor from Texas Instruments, the AVR 435 offers precision decoding of all currently available technologies from Dolby Laboratories and DTS®. In addition, older analog and two-channel program sources benefit from the latest version of Harman International's Logic 7® processing which creates a wider, more enveloping sound field with more defined channel positioning and the ability to create 7.1 sound fields from 5.1 sources. Additional processing and decoding options include MP3, Dolby® Virtual speaker and Dolby Headphone processing.

An important addition to the AVR 435's impressive list of features is EzSet/EQ™ which automates the configuration process to make it quicker, easier and more precise. Using the special microphone supplied with the unit, EzSet/EQ takes the guesswork out of entering speaker "size" and crossover information, delay times for all channels and output levels. In addition to the configuration settings, EzSet/EQ also includes room equalization so that the signals sent to each speaker are tailored to provide accurate sonic quality with your specific combination of speaker type, room size and other factors that influence room acoustics. With EzSet/EQ, your system is custom-configured in a few minutes with accuracy that previously required expensive and hard-to-use test equipment.

In tandem with EzSet/EQ, the AVR 435 includes a full set of manual configuration settings for those who wish to custom-trim their system even further. A Quadruple Crossover bass management system makes it possible to enter different crossover settings for each speaker group.

Video connections and system integration is a snap with the AVR 435, thanks to three assignable, wide-bandwidth inputs that are renameable. To further enhance the viewing experience with digital sources or displays, the AVR 435's A/V Sync Delay feature allows you to compensate for the loss of lip sync due to digital video delays individually for each input. Full-carrier IR outputs, a bi-directional RS-232 port and a learning remote with a two-line display are among the many other features that make the AVR 435's power simple to use.

The AVR 435's multizone options and a standard Zone II remote control make it possible to listen to a separate source in a room while the main home theater uses a different source. With assignable rear surround channel amplifiers, you may create a basic remote listening zone without any additional equipment. For one-wire multiroom connectivity, the AVR 435 is A-BUS Ready®, requiring only a single Category 5/5e cable and an optional remote module to power remote speakers while controlling volume and enabling full control over the program source and compatible IR-controlled devices. The unit's Multiroom outputs may also be used to feed an optional, external power amplifier and volume control.

The AVR 435's seven-channel amplifier is our time-honored high-current, ultrawide-bandwidth design with the power to reproduce the loudest crescendos or cinema sound effects while remaining virtually free from distortion or system noise.

Combining state-of-the-art circuitry, digital technology and proven performance with an elegant design that is compatible with the latest source components and video displays, the AVR 435 represents the culmination of Harman Kardon's fifty-year history of delivering the finest sonic performance.

- All popular digital and matrix surround modes, including Dolby® Digital, Dolby Digital EX, Dolby Pro Logic® IIx, DTS®, DTS-ES® Discrete and Matrix, DTS Neo:6® and DTS 96/24
- Seven channels of high-current, ultrawide-bandwidth amplification with the surround back channels assignable to either main room or remote room use
- Harman Kardon's exclusive Logic 7® processing, along with Dolby Virtual Speaker processing for use when only two speakers are available
- Dolby Headphone to create spacious, open sound fields when using headphones
- High-bandwidth, HDTV-compatible component video inputs may be assigned to any video input
- Harman Kardon's advanced EzSet/EQ™ automatically configures speaker settings and sets room equalization for quick, easy and accurate system setup
- Full bass management, including Quadruple Crossover and individual settings for each input
- A/V Sync delay adjustable for each input delivers perfect lip sync with digital programs or video displays
- Extensive Multiroom options, including a standard Zone II remote, assignable rear-channel amplifier channels and A-BUS Ready® capability for listening to a separate source in a remote zone

SAFETY INFORMATION

Important Safety Information

Verify Line Voltage Before Use

Your AVR 435 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.

Do Not Use Extension Cords

To avoid safety hazards, use only the power cord attached to your unit. We do not recommend that extension cords be used with this product. As with all electrical devices, do not run power cords under rugs or carpets or place heavy objects on them. Damaged power cords should be replaced immediately by an authorized service center with a cord meeting factory specifications.

Handle the AC Power Cord Gently

When disconnecting the power cord from an AC outlet, always pull the plug; never pull the cord. If you do not intend to use the unit for any considerable length of time, disconnect the plug from the AC outlet.

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 a staple accidentally falls inside the unit, disconnect it from the AC power source immediately, and consult an authorized service center.

CATV or Antenna Grounding

If an outside antenna or cable system is connected to this product, be certain that it is grounded so as to provide some protection against voltage surges and static charges. Section 810 of the National Electrical Code, ANSI/NFPA No. 70-1984, provides information with respect to proper grounding of the mast and supporting structure, grounding of the lead-in wire to an antenna discharge unit, size of grounding conductors, location of antenna discharge unit, connection to grounding electrodes and requirements of the grounding electrode.

NOTE TO CATV SYSTEM INSTALLER: This reminder is provided to call the CATV (Cable TV) system installer's attention to article 820-40 of the NEC that 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 435 and the heat generated by the amplifiers, there is the remote possibility that the rubber padding on the bottom of the 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.

Cleaning

When the unit gets dirty, wipe it with a clean, soft, dry cloth. If necessary, wipe it with a soft cloth dampened with mild soapy water, then a fresh cloth with clean water. Wipe 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.

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.

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 interfer-

ence 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.

Unpacking

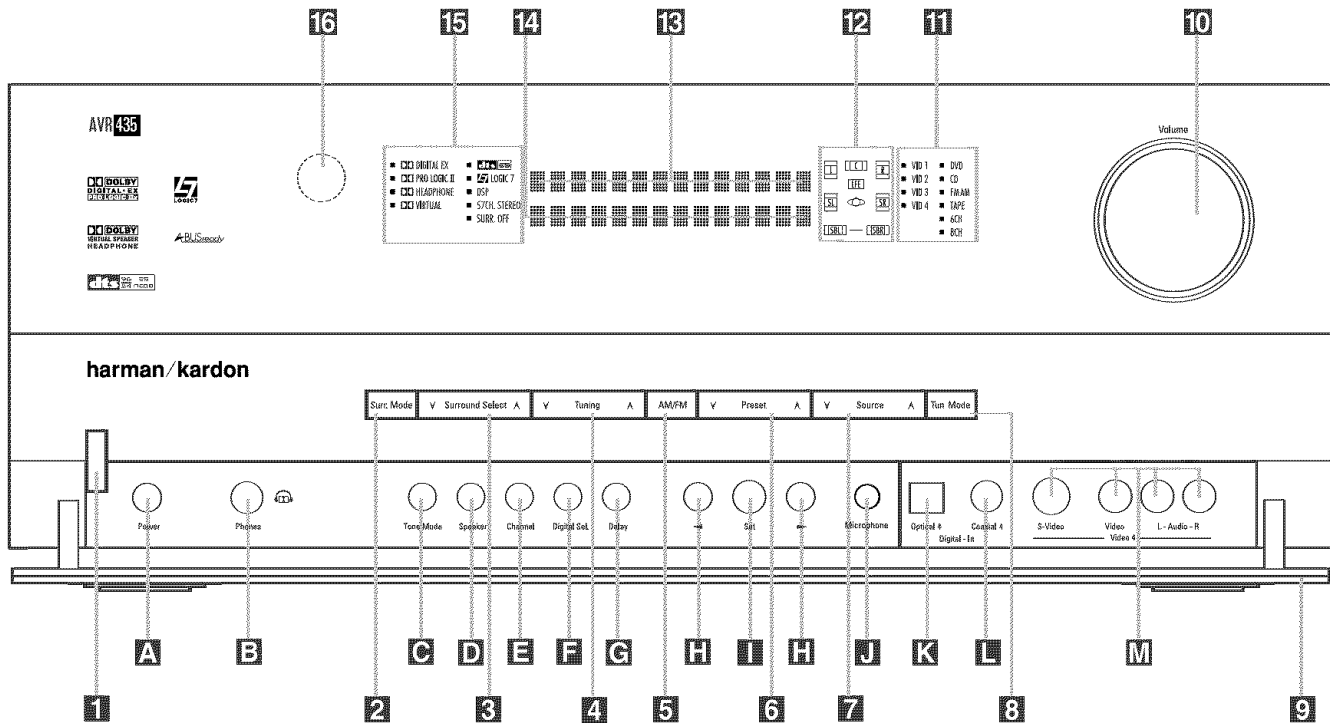
The carton and shipping materials used to protect your new receiver during shipment were specially designed to cushion it from shock and vibration. We suggest that you save the carton and packing materials for use in shipping if you move, or should the unit ever need repair.

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.

At this time, you should remove the protective plastic film from the front-panel lens. Leaving the film in place will affect the performance of your remote control.

FRONT-PANEL CONTROLS



NOTE: To make it easier to follow the instructions that refer to this illustration, a larger copy may be downloaded from the Product Support section for this product at www.harmankardon.com.

The following controls and indicators are available on the AVR 435's front panel:

- | | | |
|---------------------------------------|--|------------------------------------|
| 1 Standby/On Switch | 7 Input Source Selector | 13 Upper Display Line |
| 2 Surround Mode Group Selector | 8 Tuning Mode Selector | 14 Lower Display Line |
| 3 Surround Mode Selector | 9 Front-Panel Control Door | 15 Surround Mode Indicators |
| 4 Tuning Selector | 10 Volume Control | 16 Remote Sensor Window |
| 5 Tuner Band Selector | 11 Input Indicators | |
| 6 Preset Station Selector | 12 Speaker/Channel Input Indicators | |

The following controls and jacks are located behind the front-panel door. To open the door, place the edge of a finger on the left or right edge of the panel and gently swing the door down towards you.

- | | | |
|----------------------------------|-----------------------------------|------------------------------------|
| A Main Power Switch | F Digital Input Selector | K Optical 4 Digital Input |
| B Headphone Jack | G Delay Adjust Selector | L Coaxial 4 Digital Input |
| C Tone Mode Button | H ◀▶ Buttons | M Video 4 Audio/Video Jacks |
| D Speaker Selector Button | I Set Button | |
| E Channel Adjust Selector | J EzSet/EQ Microphone Jack | |

1 Standby/On Switch: When the **Main Power Switch A** is "ON," press this button to turn on the AVR 435; press it again to turn the unit off. Note that the illumination surrounding the switch will turn blue when the unit is on.

2 Surround Mode Group Selector: Press this button to select the top-level group of surround modes. Each press of the button will select one of the surround mode categories. Once the button is pressed so

that the name of the desired surround mode category appears in the on-screen display and in the **Lower Display Line 14**, press the **Surround Mode Selector 3** to cycle through the individual modes available. For example, press this button to select Dolby modes, and then press the **Surround Mode Selector 3** to choose from the various mode options.

3 Surround Mode Selector: Press this button to select from among the available surround mode

options for the surround mode category selected. The specific modes will vary based on the number of speakers available, the surround mode category and whether the input source is digital or analog. For example, press the **Surround Mode Group Selector 2** to select a category such as Dolby or Logic 7, and then press this button to see the specific mode choices that are available. For more information on mode selection, see page 34.

FRONT-PANEL CONTROLS

4 Tuning Selector: Press the left side of the button to tune lower-frequency stations and the right side of the button to tune higher-frequency stations. When the tuner is in the **MANUAL / MONO** mode, each tap of the Selector will increase or decrease the frequency by one increment. When the tuner receives a strong-enough signal for adequate reception, **MANUAL TUNED** will appear in the **Lower Display Line 14** and in the on-screen display. When the tuner is in the **AUTO / STEREO** mode, press the button once, and the tuner will scan for a station with acceptable signal strength. When the next higher- or lower-frequency station with a strong-enough signal is tuned, the frequency scan will stop and the **Lower Display Line 14** and the on-screen display will indicate **AUTO TUNED**. When an FM Stereo station is tuned, the display will read **AUTO ST TUNED**. See page 37 for more information on using the tuner.

5 Tuner Band Selector: Pressing this button will automatically switch the AVR 435 to the Tuner mode. Pressing it again will switch between the AM and FM frequency bands. (See page 37 for more information on the tuner.)

6 Preset Station Selector: Press this button to scroll up or down through the list of stations that have been entered into the preset memory. (See page 37 for more information on tuner programming.)

7 Input Source Selector: Press this button to change the input by scrolling up or down through the list of input sources.

8 Tuning Mode Selector: Press this button to select Auto or Manual tuning. When the button is pressed so that **AUTO / STEREO** appears in the **Upper Display Line 13**, the tuner will search for the next station with an acceptable signal when the **Tuning Selector 4 23 E** is pressed. When the button is pressed so that **MANUAL / MONO** appears in the **Upper Display Line 13**, each press of the **Tuning Selector 4 23 E** will increase the frequency. (See page 37 for more information on using the tuner.) This button may also be used to switch between Stereo and Mono modes for FM radio reception. When weak

reception is encountered, select the Manual/Mono tuning mode. Press and hold again to switch back to Stereo mode. (See page 37 for more information on using the tuner.)

9 Front-Panel Control Door: To open the door so that the front-panel jacks and controls behind this door may be accessed, gently pull the door down and towards you using either upper corner of the door.

10 Volume Control: Turn this knob clockwise to increase the volume, counterclockwise to decrease the volume. If the AVR 435 is muted, adjusting the volume control will automatically release the unit from the silenced condition.

11 Input Indicators: One of these indicators will light to identify the currently selected input. Note that the entire list will light briefly each time the unit is turned on as a test.

12 Speaker/Channel Input Indicators: These indicators are multipurpose, indicating both the speaker type selected for each channel and the incoming data-signal configuration. The left, center, right, right surround and left surround speaker indicators are composed of three boxes, while the subwoofer is a single box. The center box lights when a "small" speaker is selected, and the two outer boxes light when "large" speakers are selected. When none of the boxes are lit for the center, surround or subwoofer channels, no speaker has been assigned that position. (See page 26 for more information on configuring speakers.) The letters inside each box displays the active input channels. For standard analog inputs, only the L and R will light, indicating a stereo input. For a digital source, the indicators will light to display the channels being received at the digital input. When the letters flash, the digital input has been interrupted. (See page 36 for more information on the Channel Indicators.)

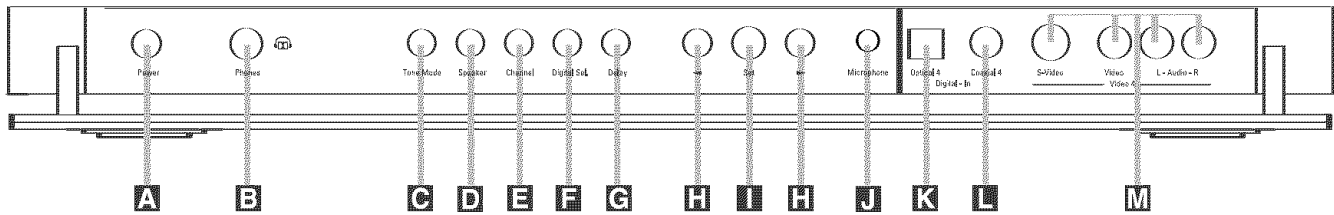
13 Upper Display Line: Depending on the unit's status, a variety of messages will appear here. In normal operation, this line will show the current input source and identify whether an analog or digital input is in use. When the tuner is selected as the input, this line will identify the station as AM or FM and show the frequency and preset number, if any.

14 Lower Display Line: Depending on the unit's status, a variety of messages will appear here. In normal operation, the current surround mode will appear on this line.

15 Surround Mode Indicators: One of these indicators will light to show the surround mode in use. Depending on the specific combination of input sources and surround mode selected, more than one indicator may light. (See page 34 for more information.)

16 Remote Sensor Window: The sensor behind this window receives infrared signals from the remote control. Aim the remote at this area and do not block or cover it unless an external remote sensor is installed.

FRONT-PANEL CONTROLS



The following controls and jacks are located behind the front-panel door. To open the door, place the edge of a finger on the left or right edge of the panel and gently swing the door down towards you.

A Main Power Switch: Press this switch to apply power to the AVR 435. When the switch is pressed in, the unit is placed in a Standby mode, as indicated by the amber illumination surrounding the **Standby/On Switch 1**. This button **MUST** be pressed in to operate the unit. To turn the unit off and prevent the use of the remote control, this switch should be pressed until it pops out from the front panel so that the word "OFF" may be read at the top of the switch.

NOTE: This switch is normally left in the "ON" position.

B Headphone Jack: This jack may be used to listen to the AVR 435's output through a pair of headphones. Be certain that the headphones have a standard 1/4" stereo phone plug, or that you use an adaptor, as needed, to convert the plug on your headphones to the 1/4" jack used on the AVR. When the headphone jack is in use, the main room speakers will automatically be turned off and the unit will output a standard stereo signal. You may also use one of the Dolby Headphone modes for an enhanced listening experience. For more information on headphone listening, see page 33.

C Tone Mode Button: This button controls the tone mode settings, enabling adjustment of the bass and treble boost/cut. You may also use it to take the tone controls out of the signal path completely for "flat" response. The first press of the button displays a **TONE MODE** message in the **Lower Display Line 14** and in the on-screen display. To take the controls out of the signal path, press either of the **◀▶ Buttons H** until the display reads **TONE OUT**. To change the bass or treble settings, press the button again until the desired option appears in the **Lower Display Line 14** and in the on-screen display and then press either of the **◀▶ Buttons H** to enter the desired boost or cut setting. See page 32 for more information on the tone controls.

D Speaker Selector Button: Press this button to begin the process of configuring the AVR 435 for the type of speakers it is being used with. For complete information on configuring the speaker settings, see page 26.

E Channel Adjust Selector: Press the button to begin the process of adjusting the channel level outputs using the source currently playing through your AVR. For complete information on adjusting the channel output level, see page 29.

F Digital Input Selector: Press this button to begin the process of selecting a digital source for use with the currently selected input. Once the button has been pressed, use the **◀▶ Buttons H** to choose the desired input and then press the **Set Button I** to enter the setting into the unit's memory. See page 33 for more information on digital audio.

G Delay Adjust Selector: Press this button to begin the process of adjusting the delay settings for Dolby surround modes. See page 28 for more information on delay adjustments.

H ◀▶ Buttons: When making system configuration changes using the front-panel controls, press these buttons to scroll through the available choices for the option being adjusted.

I Set Button: When making system configuration changes using the front-panel controls, press this button to enter a setting into the unit's memory.

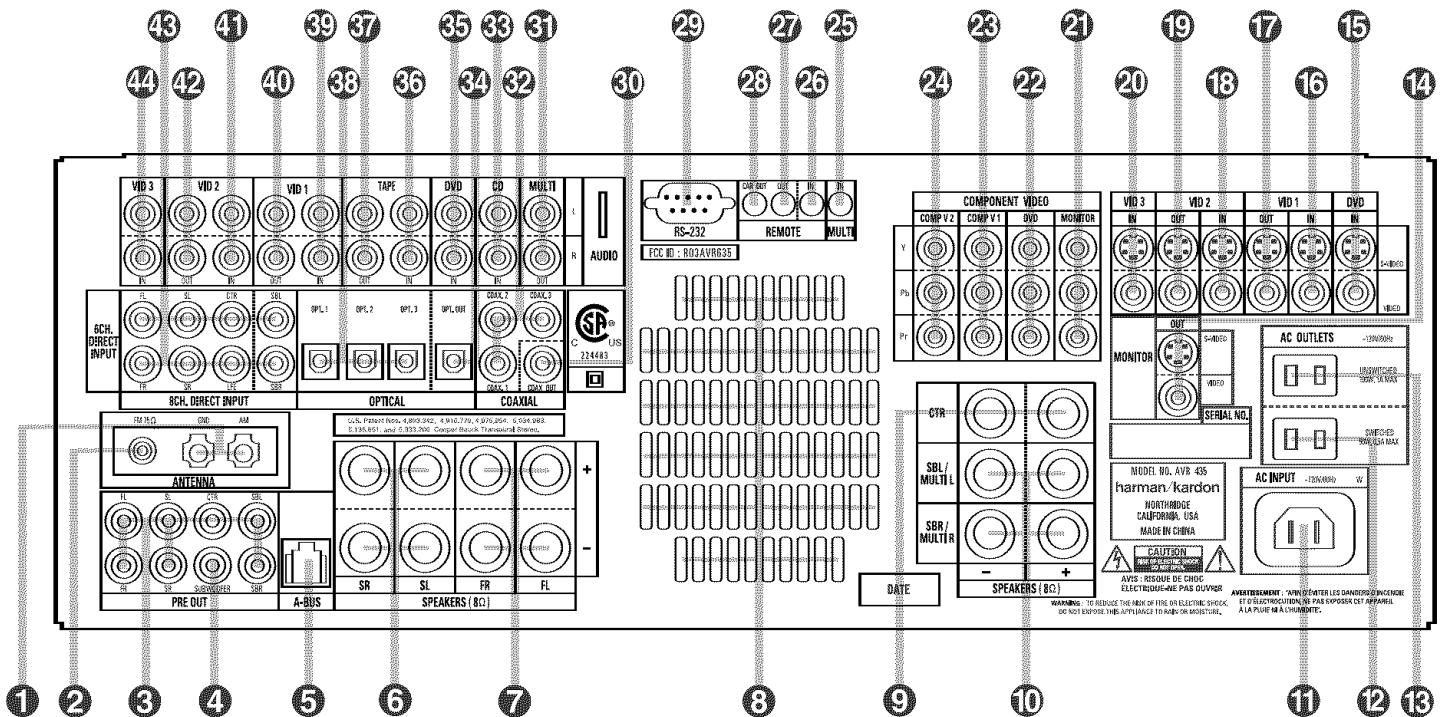
J EzSet/EQ Microphone Jack: Before starting the EzSet/EQ automated setup process, plug the microphone into this jack. The microphone does not need to be plugged in at other times.

K Optical 4 Digital Input: Connect the optical digital output of an audio or video product to this jack.

L Coaxial 4 Digital Input: Connect the coaxial digital output of a digital audio product such as a portable audio player or video game to this jack.

M Video 4 Jacks: These audio/video jacks may be used for temporary connection to video games or portable audio/video products such as camcorders and portable audio players.

REAR-PANEL CONNECTIONS



- 1 AM Antenna
- 2 FM Antenna
- 3 Preamp Outputs
- 4 Subwoofer Output
- 5 A-BUS Connector
- 6 Surround Speaker Outputs
- 7 Front Speaker Outputs
- 8 Fan Vents
- 9 Center Speaker Outputs
- 10 Surround Back/Multiroom Speaker Outputs
- 11 AC Power Cord
- 12 Switched AC Accessory Outlet
- 13 Unswitched AC Accessory Outlet
- 14 Video Monitor Outputs
- 15 DVD Video Inputs
- 16 Video 1 Video Inputs
- 17 Video 1 Video Outputs
- 18 Video 2 Video Inputs
- 19 Video 2 Video Outputs
- 20 Video 3 Video Inputs
- 21 Component Video Monitor Outputs
- 22 DVD Component Video Inputs
- 23 Component Video 1 Inputs
- 24 Component Video 2 Inputs
- 25 Multiroom IR Input
- 26 Remote IR Input
- 27 Remote IR Output
- 28 Remote IR Carrier Output
- 29 RS-232 Port
- 30 Coaxial Digital Audio Output
- 31 Multiroom Audio Outputs
- 32 Coaxial Digital Audio Inputs
- 33 CD Audio Inputs
- 34 Optical Digital Audio Output
- 35 DVD Audio Inputs
- 36 Tape Inputs
- 37 Tape Outputs
- 38 Optical Digital Audio Inputs
- 39 Video 1 Audio Inputs
- 40 Video 1 Audio Outputs
- 41 Video 2 Audio Inputs
- 42 Video 2 Audio Outputs
- 43 Video 3 Audio Inputs
- 44 Video 3 Audio Outputs

NOTE: To make it easier to follow the instructions that refer to this illustration, a larger copy may be downloaded from the Product Support section for this product at www.harmankardon.com.

NOTE: To assist in making the correct connections for multichannel input, output and speaker connections, all connection jacks and terminals are color-coded as follows:					
Front Left:	White	Surround Left:	Blue	Component Video "Y":	Green
Front Right:	Red	Surround Right:	Gray	Component Video "Pr":	Red
Center:	Green	Surround Back Left:	Brown	Component Video "Pb":	Blue
		Surround Back Right:	Tan	Optical Digital In:	Black
		Subwoofer:	Purple	Optical Digital Out:	Gray
		Coaxial Digital Audio:	Orange		
		Composite Video:	Yellow		

REAR-PANEL CONNECTIONS

1 AM Antenna: Connect the AM loop antenna supplied with the receiver to these terminals. If an external AM antenna is used, make connections to the **AM** and **GND** terminals in accordance with the instructions supplied with the antenna.

2 FM Antenna: Connect the supplied indoor or an optional external FM antenna to this terminal.

3 Preamp Outputs: Connect these jacks to an optional, external power amplifier for applications where higher power is desired.

4 Subwoofer Output: Connect this jack to the line-level input of a powered subwoofer. If an external subwoofer amplifier is used, connect this jack to the subwoofer amplifier input.

5 A-BUS Connector: Connect this jack to an optional A-BUS®-certified remote room product to extend the multiroom capabilities of your AVR 435. See page 17 for more information on A-BUS.

6 Surround Speaker Outputs: Connect these outputs to the matching + and – terminals on your surround channel speakers. In conformance with the CEA color-code specification, the blue terminal is the positive (+) terminal that should be connected to the red (+) terminal on the Surround Left speaker with older color-coding, while the gray terminal should be connected to the red (+) terminal on the Surround Right speaker with the older color-coding. Connect the black (–) terminal on the AVR to the matching black negative (–) terminals for each surround speaker. (See page 16 for more information on speaker polarity.)

7 Front Speaker Outputs: Connect these outputs to the matching + or – terminals on your left and right speakers. When making speaker connections, always make certain to maintain correct polarity by connecting the color-coded (white for front left and red for front right) (+) terminals on the AVR 435 to the red (+) terminals on the speakers and the black (–) terminals on the AVR 435 to the black (–) terminals on the speakers. See page 16 for more information on speaker polarity.

8 Fan Vents: These ventilation holes are the output of the AVR 435's airflow system. To ensure proper operation of the unit and to avoid possible damage to delicate surfaces, make certain that these holes are not blocked and that there is at least 3 inches of open space between the vent holes and any wooden or fabric surface. It is normal for the fan to remain off at most normal volume levels. An automatic temperature sensor turns the fan on only when it is needed.

9 Center Speaker Outputs: Connect these outputs to the matching + and – terminals on your center channel speaker. In conformance with the CEA color-code specification, the green terminal is the positive (+) terminal that should be connected to the red (+) terminal on speakers with the older color-coding. Connect the black (–) terminal on the AVR to the black negative (–) terminal on your speaker. (See page 16 for more information on speaker polarity.)

10 Surround Back/Multiroom Speaker Outputs: These speaker terminals are normally used to power the surround back left/surround back right speakers in a 7.1-channel system. However, they may also be used to power the speakers in a second zone, which will receive the output selected for a multiroom system. To change the output fed to these terminals from the default of the Surround Back speakers to the Multiroom Output, you must change a setting in the Advanced Menu of the OSD system. See page 41 for more information on configuring this speaker output. In normal surround system use, the brown and black terminals are the surround back left channel positive (+) and negative (–) connections and the tan and black terminals are the surround back right positive (+) and negative (–) terminals. For multiroom use, connect the brown and black SBL terminals to the red and black connections on the left remote zone speaker and connect the tan and black SBR terminals to the red and black terminals on the right remote zone speaker.

11 AC Power Cord Jack: Connect the AC power cord to this jack when the installation is complete. To ensure safe operation, use only the power cord supplied with the unit. If a replacement is required, it must be of the same type and capacity.

12 Switched AC Accessory Outlet: These outlets may be used to power any device you wish to have turned on when the AVR 435 is turned on with the **Standby/On Switch 1**.

13 Unswitched AC Accessory Outlet: This outlet may be used to power any AC device. The power will remain on at this outlet, regardless of whether the AVR 435 is on or off.

NOTE: The total power consumption of all devices connected to the accessory outlets should not exceed 100 watts.

14 Video Monitor Outputs: Connect these jacks to the composite or S-video input of a TV monitor or video projector to view the on-screen menus and the output of any standard video source selected by the receiver's video switcher.

15 DVD Video Inputs: Connect the composite or S-video outputs of a DVD player or other video source to these jacks.

16 Video 1 Video Inputs: Connect the composite or S-video PLAY/OUT jacks of a VCR or other video source to these jacks.

17 Video 1 Video Outputs: Connect the composite or S-video REC/IN jacks of a VCR or other video recording device such as a DVD recorder or PVR to these jacks.

18 Video 2 Video Inputs: Connect the composite or S-video PLAY/OUT jacks of a VCR or other video source to these jacks.

19 Video 2 Video Outputs: Connect the composite or S-video REC/IN jacks of a VCR or other video recording device such as a DVD recorder or PVR to these jacks.

20 Video 3 Video Inputs: Connect the composite or S-video PLAY/OUT jacks of a VCR or other video source to these jacks.

21 Component Video Monitor Outputs: Connect these outputs to the component video inputs of a video projector or monitor. When a source connected to one of the **Component Video Inputs 22/23** is selected, the signal will be sent to these jacks.

22 DVD Component Video Inputs: These inputs may be used with any source device equipped with analog Y/Pr/Pb or RGB component video outputs. The factory default is for these jacks to be linked to the DVD input, but you may change the setting at any time through the **INPUT SETUP** menu. See page 21 for more information on configuring the component video inputs.

23 Component Video 1 Inputs: These inputs may be used with any source device equipped with analog Y/Pr/Pb or RGB component video outputs. The factory default is for these jacks to be linked to the DVD input, but you may change the setting at any time through the **INPUT SETUP** menu. See page 21 for more information on configuring the component video inputs.

24 Component Video 2 Inputs: These inputs may be used with any video source device equipped with analog Y/Pr/Pb or RGB component video outputs. The factory default is for these jacks to be linked to the Video 2 input, but you may change the setting at any time through the **INPUT SETUP** menu. See page 21 for more information on configuring the component video inputs.

25 Multiroom IR Input: Connect the output of an IR sensor in a remote room to this jack to operate the AVR 435's multiroom control system.

REAR-PANEL CONNECTIONS

26 Remote IR Input: If the AVR 435's front-panel IR sensor is blocked due to cabinet doors or other obstructions, an external IR sensor may be used. Connect the output of the sensor to this jack.

27 Remote IR Output: This connection permits the IR sensor in the receiver to serve other remote controlled devices. Connect this jack to the "IR IN" jack on compatible Harman Kardon equipment.

28 Remote IR Carrier Output: The output of this jack is the full signal received at the **Remote Sensor Window 16** or input through the **Remote IR Input 26** including the carrier frequency that is removed from signals at the **Remote IR Output 27**. Use this output to extend IR remote signals to the input of compatible products by direct connection or through the use of optional, external IR "blasters". If you are in doubt as to which of the two IR Output jacks to use, we recommend that you consult with your dealer or installer, or check with the manufacturer of the external equipment you wish to control.

29 RS-232 Port: This jack may be used to control the AVR 435 over a bi-directional RS-232 serial control link to a compatible computer or programmable remote control system. Due to the complexity of programming RS-232 commands, we strongly recommend that connections to this port for control purposes be made by a trained and qualified technician. This jack may also link to a compatible computer to upgrade the software and operating system of the AVR 435 when upgrades are available.

30 Coaxial Digital Audio Output: Connect this jack to the coaxial digital input of a CD-R/RW, MiniDisc or other compatible digital recorder.

31 Multiroom Audio Outputs: Connect these jacks to the optional external audio power amplifier and video distribution system that delivers the source selected for multizone distribution.

32 Coaxial Digital Audio Inputs: Connect the coax digital output from a DVD player, HDTV receiver, the S/P-DIF output of a compatible computer sound card playing MP3 files or streams, LD player or CD player to these jacks. The signal may be a Dolby Digital signal, DTS signal or a standard PCM digital source. Do not connect the RF digital output of an LD player to these jacks.

33 CD Audio Inputs: Connect these jacks to the left/right analog audio output of a compact disc player or CD changer or other audio source.

34 Optical Digital Audio Output: Connect this jack to the optical digital input connector on a CD-R/RW, MiniDisc or other compatible digital recorder.

35 DVD Audio Inputs: Connect the left/right analog outputs of a DVD player or other audio source to these jacks.

36 Tape Inputs: Connect these jacks to the Play/Out jacks of an audio recorder.

37 Tape Outputs: Connect these jacks to the Record/Input jacks of an audio recorder.

38 Optical Digital Audio Inputs: Connect the optical digital output from a DVD player, HDTV receiver, the S/P-DIF output of a compatible computer sound card playing MP3 files or streams, LD player or CD player to these jacks. The signal may be a Dolby Digital signal, a DTS signal or a standard PCM digital source.

39 Video 1 Audio Inputs: Connect the left/right PLAY/OUT audio output jacks on a VCR or other video source to these jacks.

40 Video 1 Audio Outputs: Connect the left/right REC/IN audio input jacks on a VCR or other video source to these jacks.

41 Video 2 Audio Inputs: Connect the left/right PLAY/OUT audio output jacks on a VCR or other video source to these jacks.

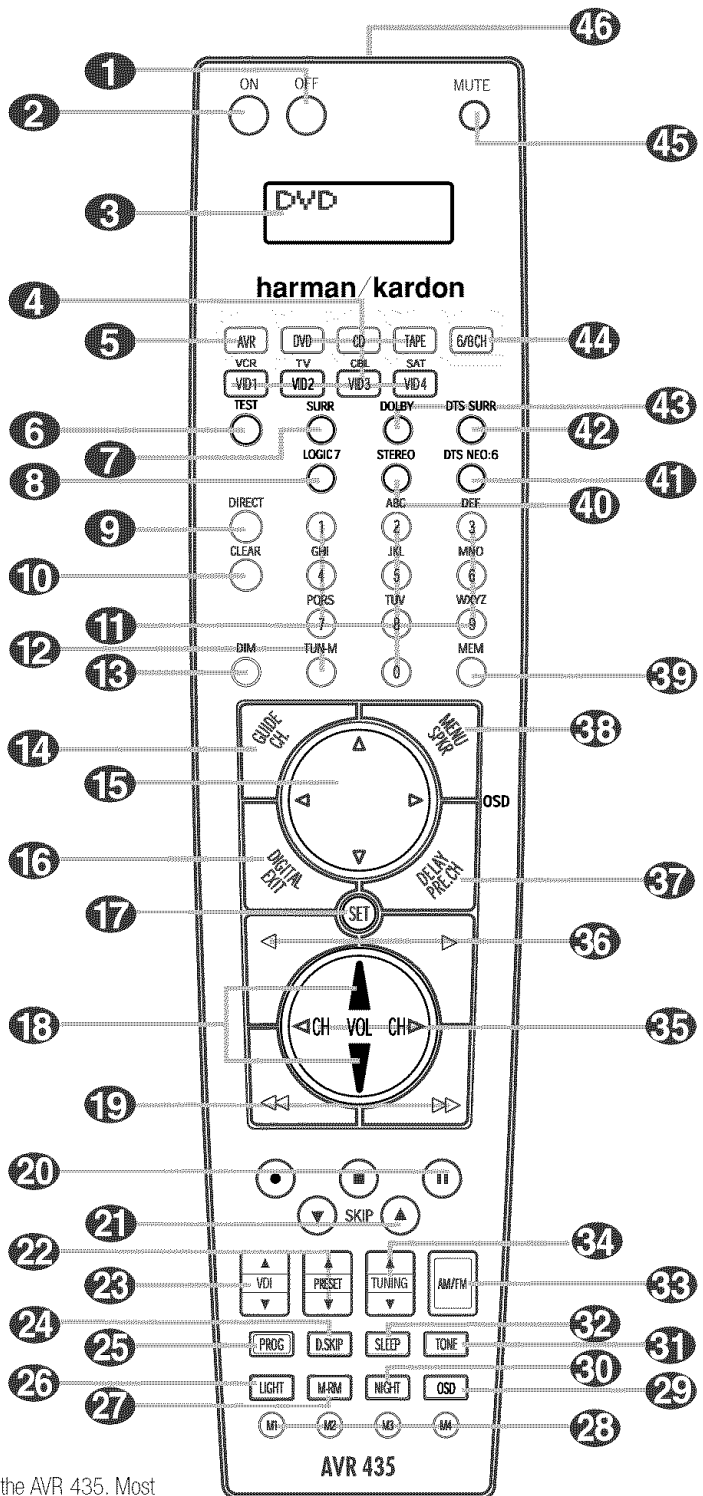
42 Video 2 Audio Outputs: Connect the left/right REC/IN audio input jacks on a VCR or other video source to these jacks.

43 8-Channel Direct Inputs: These jacks are used for connection to source devices such as DVD-Audio or SACD players with discrete analog outputs. Depending on the source device in use, all eight jacks may be used, though in many cases only connections to the front left/right, center, surround left/right and LFE (subwoofer input) jacks will be used for standard 5.1 audio signals.

44 Video 3 Audio Inputs: Connect the left/right PLAY/OUT audio output jacks on a VCR, PVR, cable set-top, satellite receiver, HDTV receiver or other video source to these jacks.

MAIN REMOTE CONTROL FUNCTIONS

- 1 Power Off Button
- 2 Power On Button
- 3 LCD Information Display
- 4 Input Selectors
- 5 AVR Selector
- 6 Test Button
- 7 DSP Surround Mode Selector
- 8 Logic 7 Mode Select Button
- 9 Direct Button
- 10 Clear Button
- 11 Numeric Keys
- 12 Tuning Mode Button
- 13 Dim Button
- 14 Channel Select Button
- 15 Navigation Button
- 16 Digital Select Button
- 17 Set Button
- 18 Volume Up/Down Selectors
- 19 Transport Fast-Play/Scan Buttons
- 20 Main Transport Controls
- 21 Track Skip Up/Down Buttons
- 22 Preset Up/Down Button
- 23 Video Input Button
- 24 Disc Skip Button
- 25 Program Button
- 26 Light Button
- 27 Multiroom Button
- 28 Macro Buttons
- 29 OSD Button
- 30 Night Mode Button
- 31 Tone Control Button
- 32 Sleep Button
- 33 AM/FM Button
- 34 Tuning Up/Down Button
- 35 Channel Up/Down Selector
- 36 Transport Play Buttons
- 37 Delay Select Button
- 38 Speaker Select Button
- 39 Memory Button
- 40 Stereo Mode Select Button
- 41 DTS Neo:6 Mode Select Button
- 42 DTS Digital Mode Select Button
- 43 Dolby Mode Select Button
- 44 6/8-Channel Input Select
- 45 Mute Button
- 46 Lens



NOTES:

- The function names shown here are each button's feature when used with the AVR 435. Most buttons have additional functions when used with other devices. When a button is pressed, the function name will appear in the bottom line of the LCD Information Display 3.
- The jack on the upper right side of the remote is reserved for future use. Do not remove the plug provided or connect any device to the jack.
- To make it easier to follow the instructions that refer to this illustration, a larger copy may be downloaded from the Product Support section for this product at www.harmankardon.com.

MAIN REMOTE CONTROL FUNCTIONS

IMPORTANT NOTE: The AVR 435's remote may be programmed to control up to eight devices, including the AVR 435. Before using the remote, it is important to remember to press the **Input Selector Button 4** that corresponds to the unit you wish to operate. In addition, the AVR 435's remote is shipped from the factory to operate the AVR 435 and most Harman Kardon CD or DVD players and cassette decks. The remote is also capable of operating a wide variety of other products using the control codes that are part of the remote. Before using the remote with other products, follow the instructions on pages 43 – 46 to program the proper codes for the products in your system.

It is also important to remember that many of the buttons on the remote take on different functions, depending on the product selected using the **Input Selectors 4**. The descriptions shown here primarily detail the functions of the remote when it is used to operate the AVR 435.

1 Power Off Button: Press this button to place the AVR 435 or a selected device in the Standby mode. Note that this will turn off the main room functions, but if the Multiroom system is activated, it will continue to function.

2 Power On Button: Press this button to turn on the power to a device selected by first pressing one of the **Input Selectors 4**.

3 LCD Information Display: This two-line screen displays various information depending on the commands that have been entered into the remote.

4 Input Selectors: Pressing one of these buttons will perform three actions at the same time. First, if the AVR 435 is not turned on, this will power up the unit. Next, it will select the source shown on the button as the input to the AVR 435. Finally, it will change the remote control so that it controls the device selected. In normal operation, the remote will revert to controlling the AVR when no button is pressed for 6 seconds.

This allows the remote to automatically return to control of important functions such as volume, mute and surround mode selection after you have used the remote to control another device. If you wish to change the length of time that the remote operates another device, or to have the remote remain active for control of the other device (such as a DVD player or set-top box) until you manually return control to the AVR by pressing the **AVR Selector 5**, follow the instructions on page 52.

5 AVR Selector: Pressing this button will switch the remote so that it will operate the AVR 435's functions. If the AVR 435 is in the Standby mode, it will also turn the AVR 435 on.

6 Test Button: Press this button to begin the sequence used to manually calibrate the AVR 435's output levels. (See page 29 for more information on calibrating the AVR 435.)

7 DSP Surround Mode Selector: Press this button to select one of the DSP surround modes, such as VMAx, Hall 1, Hall 2 or Theater. Each press of the button selects another mode. (See page 34 for more information on surround modes.)

8 Logic 7 Mode Select Button: Press this button to select from among the available Logic 7 surround modes. (See page 34 for the available Logic 7 options.)

9 Direct Button: Press this button when the tuner is in use to start the sequence for direct entry of a station's frequency. After pressing the button, simply press the proper **Numeric Keys 11** to select a station. (See page 37 for more information on the tuner.)

10 Clear Button: When programming the remote or using the EzSet feature, press this button to cancel the current function. When using the remote to enter frequencies for direct tuner access, press this button to clear previous entries.

11 Numeric Keys: These buttons serve as a 10-button numeric keypad to enter tuner preset positions. They are also used to select channel numbers when TV, Cable or SAT has been selected on the remote, or to select track numbers on a CD, DVD or LD player, depending on how the remote has been programmed. These buttons are also used to enter letters and numbers when renaming devices in the LCD Information Display. (See page 50 for more information on renaming devices and keys.)

12 Tuning Mode Button: Press this button to change the tuner mode between manual and automatic. When the button is pressed so that **AUTO / STEREO** appears in the **Upper Display Line 13** and in the on-screen display, only stations with acceptable signal quality will be tuned, and the tuner will play FM stations in stereo, when available. In the **AUTO** mode, when the **Tuning Up/Down Buttons 4 34 E** are pressed, the unit will automatically search for the next available station with good signal strength. When this button is pressed so that **MANUAL / MONO** appears in the **Upper Display Line 13** and in the on-screen display, each press of the **Tuning Up/Down Buttons 4 34 E** will move the frequency up or down in single-step increments. When the FM band is in use, pressing the button so that the **MANUAL** mode is activated will enable you to tune stations with weak signals by changing to monaural reception. (See page 37 for more information on tuner operation.)

13 Dim Button: Press this button to activate the Dimmer function, which reduces the brightness of the front-panel display, or turns it off entirely. Press the button once to change the display to reduce the brightness by 50%, and press it again within 5 seconds and the main display will go completely dark. Note that this setting is temporary; regardless of any changes, the display will always return to full brightness when the AVR is turned on. The blue illumination around the **Standby/On Switch 1** will always remain at full brightness regardless of the setting to remind you that the AVR is still turned on. The blue accent lighting inside the volume control will also remain at full brightness when the panel is at 50%, but go out when the panel lights are fully dimmed.

14 Channel Select Button: This button is used to start the process of setting the AVR 435's output levels to an external source. Once this button is pressed, press the **▲/▼** on the **Navigation Button 15** to select the channel being adjusted, then press the **Set Button 17**, followed by the **▲/▼** on the **Navigation Button 15** again, to change the level setting. (See page 38 for more information.)

15 Navigation Button: This single disc-like button is used to navigate through the on-screen configuration menus, to scroll through the options list and to select choices for the various settings such as delay, speakers, surround modes, digital inputs, etc. To use the button, simply press it left, right, up or down in the direction indicated by the **▲/▼/◀▶** icons printed on the button disc. Depending on the menu being used, pressing the button will either change a specific menu or configuration choice, or it will change the option shown in the on-screen or front-panel display. The sections in this manual describing the unit's individual features and configuration options contain specific information on how the navigation controls are used.

16 Digital Select Button: Press this button to assign one of the digital inputs **33 36 K/L** to a source. (See page 33 for more information on using digital inputs.)

17 Set Button: This button is used to enter settings into the AVR 435's memory. It is also used in the setup procedures for delay time, speaker configuration and channel output level adjustment.

18 Volume Up/Down Buttons: These controls share the common disc in the lower third of the remote. To raise the volume, press the button marked **▲** by pressing towards the top of the remote. To lower the volume, press the button marked **▼** by pressing towards the bottom of the remote. The **◀▶** buttons on the left and right sides of this disc change channels up or down when the TV, cable box or satellite **Input Selectors 4** have been pressed.

MAIN REMOTE CONTROL FUNCTIONS

19 Transport Fast-Play/Scan Buttons: These buttons have no direct function on the AVR 435, but they are used when the remote is programmed for a compatible DVD, CD or tape player. Pressing these buttons will transmit a fast-play forward, fast-play reverse, or fast-forward or -reverse scan command, according to the capabilities of the player being controlled. In the factory default setting, these buttons are preprogrammed with the remote codes for Harman Kardon DVD players so that you may control a compatible player without having to switch devices.

20 Main Transport Controls: These buttons have no direct function on the AVR 435, but they are used when the remote is programmed for a compatible DVD, CD or tape player. Pressing these buttons will transmit a stop (■), record (●), or pause (⏸) command, according to the capabilities of the player being controlled. In the factory default setting, these buttons are programmed with the remote codes for Harman Kardon DVD players so that you may control a compatible player without having to switch devices.

21 Track Skip Up/Down Buttons: These buttons do not have a direct function with the AVR 435, but when used with a compatibly programmed CD or DVD changer will change the track or chapter currently being played. In the factory default setting, these buttons are programmed with the remote codes for Harman Kardon DVD players so that you may control a compatible player without having to switch devices.

22 Preset Up/Down Button: When the tuner is in use, press this button to scroll through the stations programmed into the AVR 435's memory.

23 VDI Button: This button does not have any function for the AVR, but is provided for your use in programming the codes that are used to scroll up or down through the available inputs on your video display. This allows you to switch video inputs that are directly connected to your video display. Alternatively, you may program any compatible remote code into the "up" and "down" portions of this button. For information on "learning" remote codes into a button on the AVR remote, follow the instructions shown on page 44.

24 Disc Skip Button: This button has no direct function for the AVR 435 but may be used to change the disc in a CD or DVD changer when the remote is programmed for that type of device.

25 Program Button: This button is used to begin the process of programming the remote. Press and hold this button for 3 seconds to place the remote in the programming mode. Once the red LED under the **Set Button 17** lights, release the button. You may then select from the desired option. (See pages 43–53 for more information on configuring the remote.)

26 Light Button: Press this button to activate the remote's backlight for ease of use in darkened rooms.

27 Multiroom Button: Press this button to begin the process of activating the multiroom system or to change the input or volume level for the second zone. (See page 41 for more information on the multiroom system.)

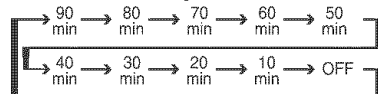
28 Macro Buttons: Press these buttons to store or recall a "Macro", which is a preprogrammed sequence of commands stored in the remote. (See page 46 for more information on macros.)

29 OSD Button: Press this button to activate or turn off the On-Screen Display (OSD) system used to set up or adjust the AVR 435's parameters.

30 Night Mode Button: Press this button to activate the Night mode. This mode is available in specially encoded Dolby Digital sources, and it preserves dialogue (center channel) intelligibility at low volume levels.

31 Tone Control Button: This button controls the tone mode settings, enabling adjustment of the bass and treble boost/cut. You may also use it to take the tone controls out of the signal path completely for "flat" response. The first press of the button displays a **TONE IN** message in the **Lower Display Line 14** and in the on-screen display. To take the controls out of the signal path, press either of the **▲/▼ Navigation Buttons 15** until the display reads **TONE OUT**. To change the bass or treble settings, press the button again until the desired option appears in the **Lower Display Line 14** and in the on-screen display and then press either of the **▲/▼ Navigation Buttons 15** to enter the desired boost or cut setting. See page 32 for more information on the tone controls.

32 Sleep Button: Press this button to place the unit in the Sleep mode. After the time shown in the display, the AVR 435 will automatically go into the Standby mode. Each press of the button changes the time until turn-off in the following order:



When the Sleep timer is in use, the front-panel display indicators will dim to half brightness.

33 AM/FM Button: Press this button to select the AVR 435's tuner as the listening choice. Pressing this button when the tuner is already in use will select between the AM and FM bands.

34 Tuning Up/Down Button: Press this button when the tuner is in use to change the station to one with a higher or lower frequency. When the tuner is in the **MANUAL / MONO** mode, each tap of the Selector will increase or decrease the frequency by one increment. When the tuner receives a strong-enough signal for adequate reception, **MANUAL TUNED** will appear in the **Lower Display Line 14** and in the on-screen display. When the tuner is in the **AUTO / STEREO** mode, press the button once, and the tuner will scan for a station with acceptable signal strength. When the next higher- or lower-frequency station with a strong-enough signal is tuned, the frequency scan will stop and the **Lower Display Line 14** and the on-screen display will indicate **AUTO TUNED**. When an FM Stereo station is tuned, the display will read **AUTO ST TUNED**. See page 37 for more information on using the tuner.

35 Channel Up/Down Selector: This button has no function when the AVR is being controlled, but when programmed for use with a VCR, TV, cable box, satellite receiver or other similar product, it will change the channel up or down. See pages 43 – 53 for more information on programming the remote.

36 Transport Play Buttons: These buttons have no direct function on the AVR 435, but they are used when the remote is programmed for a compatible DVD, CD or tape player. Pressing these buttons will transmit a forward- or reverse-play command, according to the capabilities of the player being controlled. In the factory default setting, these buttons are programmed for Harman Kardon DVD players so that you may control a compatible player without having to switch devices.

37 Delay Select Button: This button selects adjustments to the A/V Sync Delay and the individual channel displays. The first press of the button displays an **A / V SYNC DELAY** message in the **Lower Display Line 14** and in the on-screen display, which means that you may change the amount of time that all channels are delayed together behind the video. This enables you to compensate for the loss of lip sync that may be caused by digital video processing in your display or by television stations. To change the A/V Sync Delay, press the **Set Button 17** while the **A / V SYNC DELAY** message is visible and then use the **▲/▼ Navigation Button 15** to change the setting so that the sound and the video image are in sync. To change the delay for an individual output channel, press the **▲/▼ Navigation Button 15** until the desired channel name is shown, and then press the **Set Button 17**. Use the **▲/▼ Navigation Buttons 15** to change the delay amount. (See page 28 for more information on delay options.)

MAIN REMOTE CONTROL FUNCTIONS

38 Speaker Select Button: Press this button to begin the process of configuring the AVR 435's bass management system. Then press the **▲/▼ Navigation Button 15** to select the channel you wish to set up. Press the **Set Button 17** and then select another channel to configure. When all adjustments have been completed, press the **Set Button 17** twice to exit the settings and return to normal operation. (See page 26 for more information on speaker setup.)

39 Memory Button: Press this button to enter a radio station to the AVR 435's preset memory. First, tune the desired station, and then press this button. Within 5 seconds of when you see the station's frequency flash in the **Upper Display Line 13** and in the on-screen display, press the numeric keys for the preset number between 01 and 30 that you wish to assign to the station. (See page 37 for more information.)

40 Stereo Mode Select Button: Press this button to select a stereo listening mode. When the button is pressed so that **SURROUND OFF** appears in the **Lower Display Line 14**, the AVR will operate in a bypass mode with true, fully analog, two-channel left/right stereo mode with no surround processing or bass management, as opposed to other modes where digital processing is used. When the button is pressed so that **SURROUND OFF** appears in the **Lower Display Line 14**, and the **DSP and Surround Off Surround Mode Indicators 15** are lit, you will enjoy a two-channel presentation of the sound, along with the benefits of bass management. Depending on whether your system is configured for 5.1 or 6.1/7.1 channels, the next press of the button will cause either **5 CH STEREO** or **7 CH STEREO** to appear, and the stereo signal will be routed to all five (or seven) speakers. (See page 34 for more information on stereo playback modes.)

41 DTS Neo:6 Mode Select Button: Press this button to select a DTS Neo:6 mode. (See page 34 for the available DTS Neo:6 options.)

42 DTS Digital Mode Select Button: When a DTS-encoded digital source is playing, each press of this button will scroll through the available DTS modes. The specific choice of modes will vary according to the type of encoding on the disc and your system's speaker configuration. When a DTS source is not in use, this button has no function. (See page 34 for the available DTS digital options.)

43 Dolby Mode Select Button: This button is used to select from the available Dolby Surround modes. Each press of this button will select one of the Dolby Pro Logic II, Pro Logic IIx or Dolby Virtual Speaker modes, as available for the number of speakers in your system. When a Dolby Digital-encoded source is in use, the Dolby Digital mode may also be selected. (See page 34 for the available Dolby surround mode options.)

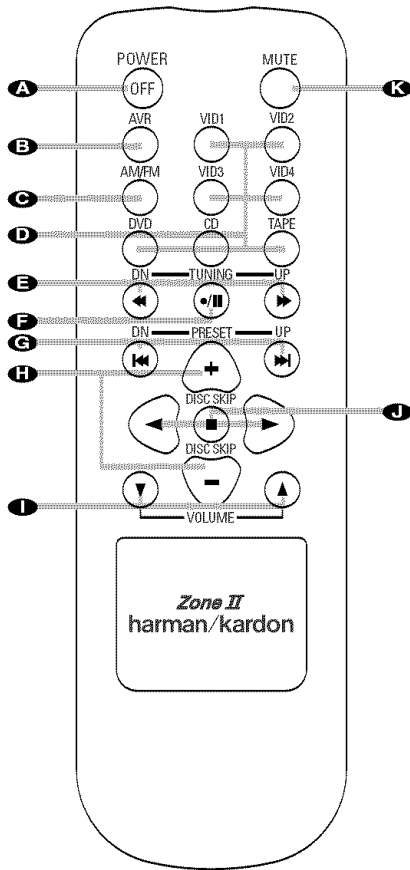
44 6-Channel/8-Channel Input Select: Press this button to select the device connected to the **6- or 8-Channel Direct Inputs 40**. (See page 32 for more information.)

45 Mute Button: Press this button to momentarily silence the AVR 435 or TV set being controlled, depending on which device has been selected.

46 Lens: The infrared emitters behind the plastic lens at the top of the remote communicate the remote codes to the AVR 435. Be certain that the lens is not covered when using the remote, and point the lens toward the AVR for best results. In learning mode, the remote receives IR codes to be learned through a sensor behind the lens.

NOTE: DO NOT remove the rubber plug that covers the jack on the upper right side of the remote. The jack is not active and is reserved for future use.

ZONE II REMOTE CONTROL FUNCTIONS



- A** Power Off Button
- B** AVR Selector Button
- C** AM/FM Tuner Selector
- D** Input Selectors
- E** Tuning Up/Down – Fast Play Buttons
- F** Record/Pause Button
- G** Preset Up/Down – Track Skip Buttons
- H** Disc Skip Button
- I** Volume Up/Down Buttons
- J** Play Forward/Reverse/Stop Buttons
- K** Mute Button

A Power Off Button: When used in the room where the AVR 435 is located, press this button to place the unit in Standby. When it is used in a remote room with a sensor that is connected to the **Multiroom IR Input Jack** 25, this button turns the Multiroom system on and off.

B AVR Selector Button: Press this button to turn on the AVR 435. The input in use when the unit was last on will be selected.

C AM/FM Tuner Selector: Press this button to select the Tuner as the input to the Multiroom system. Press it again to change between the AM and FM bands.

D Input Selectors: When the AVR 435 is off, press one of these buttons to select a specific input and turn the unit on. When the unit is already in use, pressing one of these buttons will change the input.

E Tuning Up/Down – Fast Play Buttons: When the Zone II remote is used in the same room as the AVR 435, these buttons may be used to change the frequency of the tuner. These buttons may also control the Fast Play or Fast Reverse functions of compatible Harman Kardon CD, DVD or cassette decks in the same room, or from a remote room when an IR link is connected to the AVR 435.

F Record/Pause Button: Press this button to activate the Record or Pause function on compatible Harman Kardon CD, DVD or cassette deck products.

G Preset Up/Down – Track Skip Buttons: When the AVR 435's tuner is selected as the input source, these buttons will move up or down through the list of stations that have been stored in the preset memory. When a CD or DVD changer or player is selected, these buttons activate the Forward or Reverse Track or Chapter Skip functions.

H Disc Skip Buttons: Press these buttons to change discs on compatible Harman Kardon CD or DVD changers or players.

I Volume Up/Down Buttons: When the Zone II remote is used in the room where the AVR 435 is located, press this button to raise or lower the volume in that room. When it is used in a remote room with a sensor that is connected to the **Multiroom IR Input Jack** 25, this button will raise or lower the volume in the remote room.

J Play Forward/Reverse/Stop Buttons: Press these buttons to control compatible Harman Kardon CD, DVD or cassette players.

K Mute Button: When the Zone II remote is used in the room where the AVR 435 is located, press this button to temporarily silence the unit. When it is used in a remote room with a sensor that is connected to the **Multiroom IR Input Jack** 25, this button will temporarily silence the feed to the remote room only. Press the button again to return to the previous volume level.

NOTES:

- The Zone II remote may be used in either the same room where the AVR 435 is located or in a separate room with an optional infrared sensor or A-BUS product that is connected to the AVR 435's **Multiroom IR Input Jack** 25. When it is used in the same room as the AVR 435, it will control the functions of the AVR 435 or any compatible Harman Kardon products in that room. When it is used in a separate room via a sensor connected to the **Multiroom IR Input Jack** 25, the buttons for Power, Input Source, Volume and Mute will control the source and volume for the second zone, as connected to the **Multiroom Audio Output Jacks** 31. (See page 41 for complete information on using the Multiroom system.)
- To make it easier to follow the instructions that refer to the controls and connectors in this illustration, a larger copy may be downloaded from the Product Support section for this product at www.harmankardon.com.

INSTALLATION AND CONNECTIONS

System Installation

After unpacking the unit, locating it in a place with adequate ventilation and placing it on a solid surface capable of supporting its weight, you will need to make the connections to your audio and video equipment.

IMPORTANT NOTE: For your personal safety and to avoid possible damage to your equipment and speakers, it is always good practice to turn off and unplug the AVR and ALL source equipment from the AC output before making any audio or video system connections.

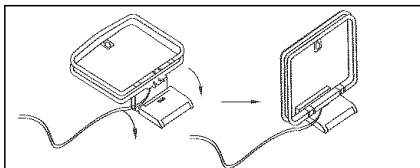
Audio Equipment Connections

We recommend that you use high-quality interconnect cables when making connections to source equipment and recorders to preserve the integrity of the signals.

1. Connect the analog output of a CD player to the **CD Audio Inputs 31**.

NOTE: If your CD player has both fixed and variable audio outputs, it is best to use the fixed output unless you find that the input to the receiver is so low that the sound is noisy, or so high that it is distorted.

2. Connect the analog Play/Out jacks of a cassette deck, MD, CD-R or other audio recorder to the **Tape Inputs 34**. Connect the analog Record/In jacks on the recorder to the **Tape Outputs 35** on the AVR 435.
3. Connect the output of any digital sources such as a CD or DVD changer or player, advanced video game, a digital satellite receiver, HDTV tuner or digital cable set-top box or the output of a compatible computer sound card to the **Optical and Coaxial Digital Audio Inputs 33 36 K/L**.
4. Connect the coaxial or optical **Digital Audio Outputs 23/30** on the rear panel of the AVR 435 to the matching digital input connections on a CD-R or MiniDisc recorder.
5. Assemble the AM loop antenna supplied with the unit so that the tabs at the bottom of the antenna loop snap into the holes in the base. Connect it to the **AM and GND Screw Terminals 1**.



6. Connect the supplied FM antenna to the **FM (75-Ohm) Connection 2**. The FM antenna may be an external roof antenna, an inside powered or wire-lead antenna or a connection from a cable TV system. If the antenna or connection uses 300-ohm twin-lead cable, you must use an optional

300-ohm-to-75-ohm adaptor to make the connection.

7. Connect the front, center, surround and surround back speaker outputs **6 7 9 10** to the respective speakers.

To ensure that all the audio signals are carried to your speakers without loss of clarity or resolution, we suggest that you use high-quality speaker cable. Many brands of cable are available and the choice of cable may be influenced by the distance between your speakers and the receiver, the type of speakers you use, personal preferences and other factors. Your dealer or installer is a valuable resource to consult in selecting the proper cable.

Regardless of the brand of cable selected, we recommend that you use cable with a gauge of 14 or smaller. Remember that in specifying cable, the lower the number, the thicker the cable.

Cable with a gauge of 16 may be used for short runs of less than 10 feet. We do not recommend that you use cables with an AWG equivalent of 18 or higher, due to the power loss and degradation in performance that will occur.

Cables that are run inside walls should have the appropriate markings to indicate listing with UL, CSA or other appropriate testing agency standards. Questions about running cables inside walls should be referred to your installer or a licensed electrician who is familiar with the NEC and/or the applicable building codes in your area.

When connecting wires to the speakers, be certain to observe proper polarity. Note that the positive (+) terminal of each speaker connection has a specific color code, as noted on page 8. However, most speakers still use a red terminal for the positive (+) connection. Connect the "negative" or "black" wire to the same terminal on both the receiver and the speaker.

NOTE: While most speaker manufacturers adhere to an industry convention of using black terminals for negative and red ones for positive, some may vary from this configuration. To ensure proper phase and optimal performance, consult the identification plate on your speaker or the speaker's manual to verify polarity. If you do not know the polarity of your speaker, ask your dealer for advice before proceeding, or consult the speaker's manufacturer.

We also recommend that the length of cable used to connect speaker pairs be identical. For example, use the same length piece of cable to connect the front-left and front-right or surround-left and surround-right speakers, even if the speakers are a different distance from the AVR 435.

8. Connections to a subwoofer are normally made via a line-level audio connection from the **Subwoofer Output 4** to the line-level input of a subwoofer with a built-in amplifier. When a passive subwoofer is used, the connection first goes to a power amplifier, which will be connected to one or more subwoofer speakers. If you are using a powered subwoofer that does not have line-level input connections, follow the instructions furnished with the speaker for connection information.

9. If an external multichannel audio source with 5.1 outputs such as an external digital processor/decoder, DVD-Audio or SACD player is used, connect the outputs of that device to the **8-Channel Direct Inputs 40**.

Video Equipment Connections

Video equipment is connected in the same manner as audio components. Again, the use of high-quality interconnect cables is recommended to preserve signal quality.

1. Connect a VCR's or other video source's audio and video Play/Out jacks to the **Video 1/Video 2 Audio and Video Input Jacks 16 18 37 39** on the rear panel. The Audio and Video Record/In jacks on the VCR should be connected to the **Video 1/Video 2 Audio and Video Output Jacks 17 19 38 41** on the AVR 435.
2. Connect the analog audio and video outputs of a satellite receiver, cable TV converter or television set or any other video source to the **Video 3 Audio and Video Input Jacks 20 42**.
3. Connect the analog audio and video outputs of a DVD or laser disc player to the **DVD Audio and Video Inputs 15 32**.
4. Connect the optical or coaxial digital audio outputs of a DVD player, satellite receiver, cable box, HDTV tuner or video game to any of the **Optical or Coaxial Digital Inputs 33 36 K/L**. The recommended connection for a DVD player is to use a coaxial digital link connected to the Coaxial Digital Audio Input 1, but you may change the digital audio input assignment for any source using the **INPUT SETUP** menu, as described on page 21 or the **Digital Input Selector F 16** on the front panel or remote (see page 33).

NOTE: When connecting a device such as a digital cable box or other set-top tuner product with a digital audio output, we recommend that you connect both the digital and analog outputs of the product to your AVR. The audio input polling feature of the AVR will then be able to make certain that you have a constant audio feed, since it will automatically switch the audio input to the analog jacks if the digital feed is interrupted or not available for a particular channel.

INSTALLATION AND CONNECTIONS

If your system requires direct connection of a video source to your display, we suggest that you consider programming the **VDI Buttons** 23 so that you may change the input used by your display from the AVR's remote. For information on "learning" remote codes into a button on the AVR remote, follow the instructions shown on page 44.

5. Connect the **Video Monitor Output Jacks** 14 on the receiver to the composite or S-video input of your television monitor or video projector.
6. If your DVD player has Y/Pr/Pb analog component video outputs, connect them to the **Component Video 1 Inputs** 22. Although this set of inputs may be assigned to any of the four video inputs on the AVR 435, the factory default is for this input to be assigned to the **DVD Audio Inputs** 32. Remember to make a digital audio connection between the DVD player and the AVR, with the **Coaxial Digital Input 1** 36 being the factory default. For information on changing the input assignments for either the component video jacks or the DVD player's audio connection, see page 21.
7. If you have other devices with Y/Pr/Pb or RGB component video outputs, connect the source device to the **Component Video 2 Inputs** 23. The audio connections may be to any of the **Video Audio Inputs** 37 39 42 **M** or the **Optical** or **Coaxial Digital Inputs** 33 36 **K L**. When using either of the Component Video Inputs, make certain that the audio and video inputs are properly configured in the **INPUT SETUP** menu, as described on page 21.
8. If the component video inputs are used, connect the **Component Video Monitor Outputs** 21 to the component video inputs of your TV, projector or display device.
9. If you have a camcorder, video game or other audio/video device that is connected to the AVR on a temporary rather than permanent basis, connect the audio, video and digital audio outputs of that device to the **Front-Panel Inputs** **K L M**. A device connected here is selected as the Video 4 input, and the digital inputs must be assigned to the Video 4 input. (See page 21 for more information on input configuration.)

System and Power Connections

The AVR 435 is designed for flexible use with multi-room systems, external control components and power amplifiers.

Main Room Remote Control Extension

If the receiver is placed behind a solid or smoked glass cabinet door, the obstruction may prevent the

remote sensor from receiving commands. In this event, an optional remote sensor may be used. Connect the output of the remote sensor to the **Remote IR Input Jack** 25.

If other components are also prevented from receiving remote commands, only one sensor is needed. Simply use this unit's sensor or a remote eye by running a connection from the **Remote IR Output Jack** 27 to the Remote IR Input jack on Harman Kardon or other compatible equipment.

Multiroom IR Link

The remote room IR receiver should be connected to the AVR 435 via standard coaxial cable. Plug the IR connection cable into the **Multiroom IR Input Jack** 25 on the AVR 435's rear panel.

If other Harman Kardon-compatible source equipment is part of the main room installation, the **Remote IR Output Jack** 27 on the rear panel should be connected to the **IR IN** jack on source equipment. This will enable the remote room location to control source equipment functions.

When a remote IR sensor is used to control non-Harman Kardon source equipment, we recommend that you make a direct connection or use an optional, external IR "blaster" connected to the **Remote IR Carrier Output Jack** 28. If you are in doubt as to which IR Output jack to use for the equipment in your system, contact your dealer or installer, or the manufacturer's support site and ask whether the unit to be controlled uses "full carrier" or "stripped" carrier IR commands. When "full carrier commands" are used, make the connection to the **Remote IR Carrier Output Jack** 28. Otherwise, make the connection to the **Remote IR Output Jack** 27 as noted above.

NOTE: All remotely controlled components must be linked together in a "daisy chain". Connect the **IR OUT** jack of one unit to the **IR IN** of the next to establish this chain.

Multiroom Connections

The AVR 435 is equipped with multizone capabilities that allow it to send a separate audio source to the remote zone from the one selected for use in the main room.

Depending on your system's requirement, three options are available for audio connection:

Option 1: Use high-quality, shielded audio interconnect cable from the AVR 435's location to the remote room. In the remote room, connect the interconnect cable to a stereo power amplifier. The amplifier will be connected to the room's speakers. At the AVR 435, plug the audio interconnect cables into the **Multiroom Audio Outputs** 29 on the AVR 435's rear panel.

Option 2: Connect the **Multiroom Audio Outputs** 29 on the AVR 435 to the inputs of an optional stereo power amplifier. Run high-quality speaker wire from the amplifier to the speakers in the remote room.

Option 3: Taking advantage of the AVR 435's built-in seven-channel amplifier, it is possible to use two of the amplifier channels to power speakers in the remote room. When using this option, you will not be able to use the full 7.1-channel capabilities of the AVR 435 in the main listening room, but you will be able to add another listening room without external power amplifiers. To use the internal amplifiers to power a remote zone, connect the speakers for the remote room location to the **Surround Back/Multiroom Speaker Outputs** 10. Before using the remote room, you will need to configure the amplifiers for surround operation by changing a setting in the **MULTIROOM** menu, following the instructions shown on page 41.

NOTE: For all options, you may connect an optional IR sensor in the remote room to the AVR 435 via an appropriate cable. Connect the sensor's cable to the **Multiroom IR Input** 25 on the AVR 435 and use the Zone II remote to control the room volume. Alternatively, you may install an optional volume control between the output of the amplifiers and the speakers.

A-BUS® Installation Connections

The AVR 435 is among the few receivers available that offer built-in A-BUS Ready operation. When used with an optional A-BUS product, you have all the benefits of remote zone operation without the need for an external power amplifier.

To use the AVR 435 with an approved A-BUS product, simply connect it to the AVR 435 using standard Category 5 wiring that is properly rated for the specific in-wall installation. Terminate the wiring at the receiver end to a standard RJ-45 connector in compliance with the instructions furnished with the A-BUS product.

You may connect a single A-BUS module to the AVR 435 with no further equipment needed. If you wish to connect more than one A-BUS module, an optional, external A-BUS hub may be used to provide that capability. Contact your dealer or www.harmankardon.com for more information on other A-BUS products available from Harman Kardon.

No further installation or adjustment is needed, as the A-BUS jack on the AVR 435 routes the signals to their proper destination for power, signal source and control. The output fed to the A-BUS jack is determined by the AVR 435's multiroom system and menus.

RS-232 Connections

The AVR 435 is equipped with an **RS-232 Serial Connection Port** 24 that may be used for two purposes. When the port is connected to a compatible,

INSTALLATION AND CONNECTIONS

optional, external computer, keypad or control system, the AVR 435 is capable of bi-directional communications that enable the external system to control the AVR, and for the AVR to report status and handshake data back to the controller. Use of the RS-232 port for this type of control requires specific technical knowledge, and we recommend that any connection and programming for control be made by a trained installer or technician familiar with the equipment being used.

The RS-232 port may also be used as an access point through which the AVR 435's operating system and surround mode memories may be updated via connection to a compatible computer. At the time that any upgrade is available, instructions for making the connection and installing the upgrade will be available through the Product Support area of the Harman Kardon Web site at harmankardon.com.

The physical connection to the AVR 435's RS-232 port is a standard D-SUB 9 connection, but to ensure compatible and proper operation, specific software commands and pin wiring schemes may be required.

AC Power Connections

This unit is equipped with two accessory AC outlets. They may be used to power accessory devices, but they should not be used with high-current draw equipment such as power amplifiers. The total power draw to each outlet may not exceed 100 watts.

The **Switched AC Accessory Outlet** ❶ is powered only when the unit is on. This is recommended for devices that have a mechanical power switch that may be left in the "ON" position.

NOTE: Many audio and video products go into a Standby mode when they are used with switched outlets. This type of product may not operate properly when used with the switched outlet.

The **Unswitched AC Accessory Outlet** ❷ is powered as long as the AVR is plugged into a powered AC outlet.

The AVR 435 features a removable power cord that allows wires to be run in advance to a complex installation so that the unit itself need not be installed until it is ready for connection. When all needed connections have been made, connect the AC Power cord to the **AC Power Cord Jack** ❸.

The AVR 435 draws significantly more current than other household devices, such as computers, that use removable power cords. For that reason, it is important that only the cord supplied with the unit (or a direct replacement of identical capacity) be used.

Once the power cord is connected, you are almost ready to enjoy the AVR 435's incredible power and fidelity!

SYSTEM CONFIGURATION

When all audio, video and system connections have been made, there are a few configuration adjustments that must be made. A few minutes spent to correctly configure and calibrate the unit will greatly add to your listening experience.

Speaker Selection and Placement

The placement of speakers in a multichannel home theater system can have a noticeable impact on the quality of sound reproduced.

No matter which type or brand of speakers is used, the same model or brand of speaker should be used for the left front, center and right front speakers. This creates a seamless front soundstage and eliminates the possibility of distracting sonic disturbances that occur when a sound moves across mismatched front channel speakers.

Speaker Placement

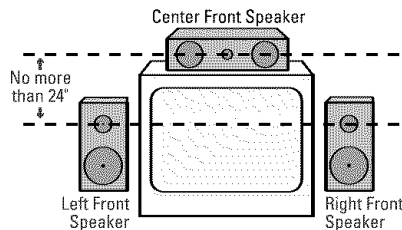
Depending on the type of center channel speaker in use and your viewing device, place the center speaker either directly above or below your TV, or in the center behind a perforated front-projection screen.

Once the center channel speaker is installed, position the front left and front right speakers so that they are as far away from one another as the center channel speaker is from the preferred listening position. Ideally, the front channel speakers should be placed so that their tweeters are no more than 24" above or below the tweeter in the center channel speaker.

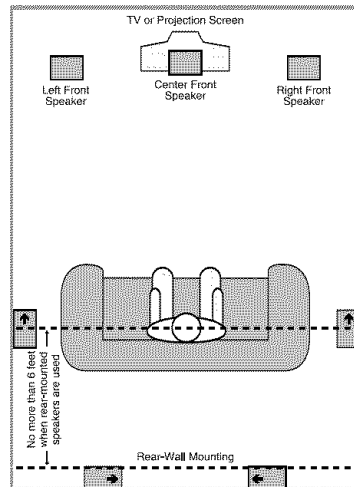
Depending on the specifics of your room acoustics and the type of speakers in use, you may find that imaging is improved by moving the left front and right front speakers slightly forward of the center channel speaker. If possible, adjust all front loudspeakers so that they are aimed at ear height when you are seated in the listening position.

Using these guidelines, you'll find that it takes some experimentation to find the correct location for the front speakers in your particular installation. Don't be afraid to move things around until the system sounds correct. Optimize your speakers so that audio transitions across the front of the room sound smooth, and that sounds from all speakers appear to arrive at the listening position at the same time (without delay from the center speaker compared to the left and right speakers).

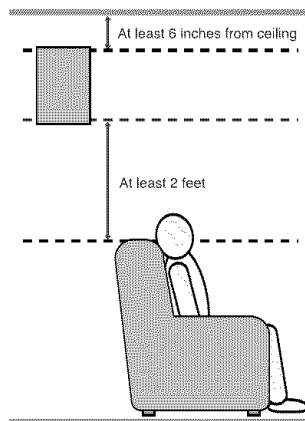
When the AVR 435 is used in 5.1-channel operation, the preferred location for surround speakers is on the side walls of the room, at or slightly behind the listening position. In a 7.1-channel system, both side surround and back surround speakers are required. The center of the speaker should face into the room. The



A) Front-channel speaker installation with direct-view TV sets or rear-screen projectors.



B) Rear speaker mounting is an alternate location for 5.1 systems. It is required for 7.1 operation.



speakers should be located so that the bottom of the cabinet is at least 2 feet higher than the listeners' ears when the listeners are seated in the desired area.

Rear surround speakers are required when a full 7.1-channel system is installed, and they may also be used in 5.1-channel systems as an alternative mounting position when it is not practical to place the main surround speakers on the sides of the room. Speakers may be placed on a rear wall, behind the listening

position. As with the side speakers, rear surrounds should be located so that the bottom of the cabinet is at least 2 feet higher than the listeners' ears. The speakers should be no more than 6 feet behind the rear of the seating area.

If dipole-type speakers are used on either the side or rear walls of the room, please note that if there are arrows on the speakers they should face the front of the room for the side speakers, or towards the center of the wall for the rear speakers.


Subwoofers produce nondirectional sound, so they may be placed almost anywhere in a room. Actual placement should be based on room size and shape and the type of subwoofer used. One method of finding the optimal location for a subwoofer is to begin by placing it in the front of the room, about 6 inches from a wall, or near the front corner of the room. Another method is to temporarily place the subwoofer at your normal listening position, and then walk around the room until you find a spot where the subwoofer sounds best. Place the subwoofer in that spot. You should also follow the instructions of the subwoofer's manufacturer, or you may wish to experiment with the best location for a subwoofer in your listening room.

System Setup

Once the speakers have been placed in the room and connected, the remaining steps in the setup process are to assign input and output connections, make any tone adjustments, select a surround mode, program the AVR 435's bass management system for the type of speakers used in your system, calibrate the output levels and set the delay times used by the surround sound processor.

Although it is necessary to assign input/output settings and surround mode choices manually, we recommend that you take advantage of the power and precision of EzSet/EQ to automatically select and enter the settings for all other audio parameters. This will not only save you time; it will ensure that your room is calibrated and equalized with an accuracy not possible when these settings are made manually.

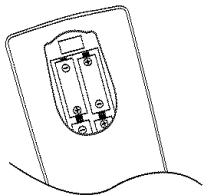
You are now ready to power up the AVR 435 to begin these final adjustments.

1. Make certain that the AC power cord is firmly inserted into the **AC Power Cord Jack**  and plug the cord into an unswitched AC outlet. To maintain the unit's safety rating, DO NOT substitute the power cord for one with lower current capacity.

SYSTEM CONFIGURATION

2. Press the **Main Power Switch A** located behind the **Front-Panel Control Door 9** in until it latches and the word "OFF" on the top of the switch disappears inside the front panel. Note that the illumination around the **Standby/On Switch 1** will turn amber, indicating that the unit is in the Standby mode.
3. Carefully remove the protective plastic film from the front-panel lens. If left in place, the film will prevent proper operation of the remote control.

4. Install four of the supplied AAA batteries in the remote as shown. Be certain to follow the (+) and (-) polarity indicators that are in the battery compartment.



5. Turn the AVR 435 on either by pressing the **Standby/On Switch 1** on the front panel, or via the remote by pressing the **Power On Button 2**, the **AVR Selector 5 B** or any of the **Input Selectors 4 34 44 C D** on the remote. The lighting around the **Standby/On Switch 1** will turn blue to confirm that the unit is on.

Using the On-Screen Display

When making the following adjustments, you may find it easier to use the AVR 435's on-screen display system. These easy-to-read displays give you a clear picture of the current status of the unit and make it easy to see which speaker, delay, input or digital selection you are making.

To view the on-screen menus, make certain you have made a connection from the **Video Monitor Out Jack 14** on the rear panel to the composite or S-video input of your TV or projector. In order to view the AVR 435's displays, the correct video source must be selected on the video display. The on-screen menus are not available when a component video display is in use.

IMPORTANT NOTE: When viewing the on-screen menus using a CRT-based projector, plasma display or direct-view CRT monitor or television, it is important that they not be left on for an extended period of time. The constant display of a static image such as these menus may cause the image to be permanently "burned into" the projection tubes, plasma screen or CRT. This type of damage is not covered by the AVR 435 warranty and may not be covered by the projector/TV set's warranty.

The AVR 435 has two on-screen display modes, "Semi-OSD" and "Full-OSD." When making configuration adjustments, it is recommended that the full-OSD mode be used. This will place an easily viewed list of the available options on the screen.

Making Configuration Adjustments

The full-OSD system is available by pressing the **OSD Button 31**. When this button is pressed, the **MASTER MENU** (Figure 1) will appear, and adjustments are made from the individual menus.



Figure 1

The semi-OSD system is also available, allowing you to make adjustments directly, by pressing the appropriate buttons on the front panel or remote control for the specific parameter to be adjusted. For example, to change the digital input for any of the sources, press the **Digital Select Button 16** and then press the **▲/▼ Navigation Button 15** to scroll through the list of options as they appear in the on-screen display or in the **Lower Display Line 14**.

To use the full-OSD menu system, press the **OSD Button 31**. When the menu is on the screen, press the **▲/▼ Navigation Button 15** until the on-screen **→** cursor is next to the item you wish to adjust, and then press the **Set Button 17** to adjust that item. The menu will remain on the screen for 20 seconds, and then they will "time-out" and disappear from the screen. The time-out may be increased to as much as 50 seconds by going to the **ADVANCED SELECT** menu, and changing the item titled **FULL OSD TIME OUT**.

When the full-OSD system is in use, the menu selections are not shown in the **Upper or Lower Display Lines 13/14**. When the full-OSD menu system is used, **OSD ON** will appear in the **Upper Display Line 13** to remind you that a video display must be used. When the semi-OSD system is used in conjunction with the discrete configuration buttons, the on-screen display will show a single line of text with the current menu selection. That selection will also be shown in the **Upper or Lower Display Lines 13/14**, depending on which parameter is being adjusted.

Setting the System Configuration Memory

The AVR 435 features an advanced memory system that enables you to establish different configurations for the speaker "size," component video assignment, digital input, surround mode and crossover frequency for each input source. This flexibility enables you to customize the way in which you listen to each source and have the AVR 435 memorize those settings. This means, for example, that you may set different speaker configurations with the resultant changes to the bass management system. Once these settings are made, they will automatically be recalled whenever you select that input.

The factory default settings for the AVR 435 have all inputs except for DVD and Video 3 configured for an analog audio input, the **Coaxial Digital Audio Input 1 36** for DVD and the **Optical Digital Input 1 38** is the default for Video 3. The default speaker settings are "Small" at all positions, with the Subwoofer on. The default setting for the surround modes is Logic 7 Music for analog sources. Dolby Digital or DTS will automatically be selected as appropriate when a digital source is in use.

Before using the unit, you may want to change the settings for some inputs so that they are properly configured to reflect the use of digital or analog inputs, the type of speakers installed and the surround mode specifics of your home theater system. Remember that since the AVR 435 memorizes the settings for each input individually, you will need to make these adjustments for each input used. However, once they are made, further adjustment is required only when system components are changed.

To make this process as quick and easy as possible, we suggest that you use the full-OSD system with the on-screen menus, and step through each input. Once you have completed the settings for the first input, many settings may be duplicated for the remaining inputs. It is also a good idea to set the configuration data in the order these items are listed in the **MASTER MENU**, as some settings require a specific entry in a prior menu item.

Input Setup

The first step is to configure each input. Once an input is selected, the settings for the Digital Input, Component Video assignment and Surround Mode will "attach" themselves to that input and be stored in a nonvolatile memory. This means that once made, the selection of an input will automatically recall those settings. For that reason, the procedures described below must be repeated for each input source so that you have the opportunity to customize each source to your specific listening requirements. However, once made, they need not be changed again unless you need to

alter a setting. The configuration settings for speaker "size" and crossover points are set once and applied to all inputs.

When using the full-OSD system to make the setup adjustments, press the **OSD Button** **11** once so that the **MASTER MENU** (Figure 1) appears. The **→** cursor will be next to the **INPUT SETUP** line. Press the **Set Button** **17** and the **INPUT SETUP** menu (Figure 2) will appear on the screen. Press the **◀▶ Navigation Button** **15** until the desired input name appears in the highlighted video, as well as being indicated in the front-panel **Input Indicators** **11**. When you are scrolling through the list of available inputs, you will hear a slight click from time to time. This is normal, as it is caused by the relay that is used to switch between the two Component Video inputs.

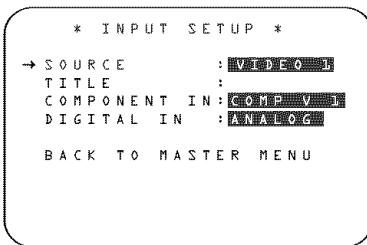


Figure 2

When one of the four Video inputs is selected as the source, you have the option of renaming the input as it appears in the on-screen and front panel messages. This is helpful if you have more than one VCR, if you wish to associate a specific product brand name with the input, or to simply enter any name that will help you to remember which source is being selected.

To change the input name, press the **▲/▼ Navigation Button** **15** on the remote so that the **→** cursor is pointing to **TITLE**. Next, press and hold the **Set Button** **17** for a few seconds until a flashing box appears to the right of the colon. Immediately release the **Set Button** **17**, as you are now ready to enter the device name.

Press the **▲/▼ Navigation Button** **15** and note that a complete set of alphanumeric characters will appear with the start of the alphabet in capital letters followed by the lowercase letters and then numbers and symbols. When you press the **▼ Navigation Button** **15**, a series of symbols and numbers will appear, followed by a reverse list of the alphabet in lowercase letters. Press the button either way until the first letter of the desired name appears. If you wish to enter a blank space as the first character, press the **▶ Navigation Button** **15**.

When the desired character appears, press the **▶ Navigation Button** **15** and repeat the process for

the next letter, and continue until the desired name is entered, up to a maximum of 14 characters. Press the **Set Button** **17** to enter the input name into the system memory and to proceed with the configuration process.

If your system includes any sources that are equipped with Y/Pr/Pb component video outputs, the AVR 435 is able to switch them to send the proper signals to your video display. Each of the two **Component Video Inputs** **22/23** may be assigned to any source for added system flexibility. The default setting is for the **Component Video 1 Jacks** **22** to be assigned to the DVD and 6/8-Channel Direct inputs, with the **Component Video 2 Jacks** **23** assigned to all other inputs. If your system does not include component video at this time, or if you do not need to change these defaults, press the **▼ Navigation Button** **15** to go to the next setting.

To change the Component Video assignment, first make certain that the **→** cursor is pointing to the **COMPONENT IN** line on the menu screen, and then press the **◀▶ Navigation Button** **15** until you see the desired input in the highlighted video. The clicking noise that you will hear when the component video inputs are switched is normal, due to the relay used to ensure proper isolation between the two inputs.

When the desired component input has been selected, press the **▼ Navigation Button** **15** to go to the next setting.

If you wish to associate one of the digital inputs with the selected input source or change the default digital input selection, press the **▼ Navigation Button** **15** on the remote while the **IN/OUT SETUP** menu (Figure 2) is on the screen, and the on-screen cursor will drop down to the **DIGITAL IN** line. Press the **◀▶ Navigation Button** **15** until the name of the desired digital input appears. To return to the analog input, press the button until the word **ANALOG** appears.

When configuring the digital input for a source device such as a digital cable box or other set-top tuner product with a digital audio output where you have connected both the digital and analog outputs of the source to the AVR, select the appropriate digital input on this menu. The digital source will become the default, and the AVR will always look there first to see whether a signal is present. However, if the digital data stream is interrupted for any reason, the AVR will automatically switch to the analog connection as a backup. This is particularly useful when configuring the connection for digital set-top boxes, where some channels feature digital sound, but others do not.

To change the digital input at any time using the discrete function buttons and the semi-OSD system, press the **Digital Select Button** **16** on the remote. Within 5 seconds, make your input selection using the **▲/▼ Navigation Button** **15** until the desired digital or analog input is shown in the **Upper Display Line** **13** and in the lower line of the on-screen display.

When all needed adjustments have been made, press the **▼ Navigation Button** **15** until the **→** cursor is next to **BACK TO MASTER MENU** to continue with the system configuration.

Audio Setup

This menu allows you to configure the tone controls and to turn the upsampling on or off. If you do not wish to change any of those settings at this time, proceed to the next menu screen. However, to make configuration changes to those parameters, make certain that the **MASTER MENU** is on screen with the **→** cursor pointing to the **AUDIO SETUP** line, and press the **Set Button** **17**. The **AUDIO SETUP** menu (Figure 3) will appear.

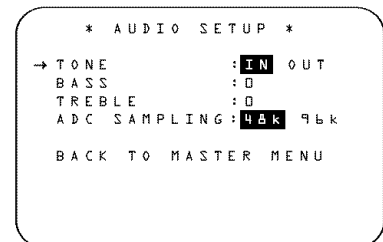


Figure 3

The first line controls whether or not the bass/treble tone controls are in the signal path. The normal default is for them to be in-line, but if you wish to remove them from the circuit for "flat" response, first make certain that the **→** cursor is pointing to the **TONE** line on the menu and press the **◀▶ Navigation Button** **15** so that **OUT** is highlighted in reverse video.

If you wish to leave the tone controls in the signal path, the amount of boost or cut for bass and treble may be adjusted by pressing the **▲/▼ Navigation Button** **15** so that the **→** cursor is next to bass or treble depending on which setting you wish to adjust. Next, press the **◀▶ Navigation Button** **15** until the desired setting is shown.

This menu also includes a setting to turn the unit's upsampling feature on or off. In normal use, this feature is turned off, which means that digital sources are processed at their native sample rate. For example, a 48kHz digital source will be processed at 48kHz. However, the AVR 435 allows you to

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upsample the incoming 48kHz signals to 96kHz for added resolution.

To take advantage of this feature, press the ▲/▼ **Navigation Button 15** so that the → cursor is next to the **UPSAMPLING** line and press the ◀▶ **Navigation Button 15** so that ON is highlighted in reverse video. Note that this feature is only available for the Dolby Pro Logic II-Music, Dolby Pro Logic II-Movie, Dolby Pro Logic and Dolby 3 Stereo modes.

When all desired changes have been made on this menu, press the ▲/▼ **Navigation Button 15** so that the → cursor is next to the **BACK TO MAIN MENU** line; press the **Set Button 17**.

Surround Setup

The next step is to set the surround mode you wish to use with the input that was previously selected in the **INPUT SETUP** menu. Since surround modes are a matter of personal taste, feel free to select any mode you wish – you may change it later. However, to make it easier to establish the initial parameters for the AVR 435, we suggest Logic 7 (Cinema or Music) for most analog inputs. In the case of inputs such as a CD Player, Tape Deck or Tuner, you may wish to set the mode to Stereo (“Surround off”) as they are not typically used with multichannel program material, and it is unlikely that surround-encoded material will be used. Alternatively, the Logic 7 Music mode is a good choice for stereo-only source material. See page 34 for more information on available surround modes.

For digital program material, the AVR will always examine the data stream and automatically select a Dolby Digital or DTS mode as applicable.

It is easiest to complete the surround setup using the full-OSD on-screen menus. From the **MASTER MENU** (Figure 1), press the ▲/▼ **Navigation Button 15** until the → cursor is next to the **SURROUND SELECT** line. Press the **Set Button 17** until the **SURROUND SELECT** menu (Figure 4) is on the screen.

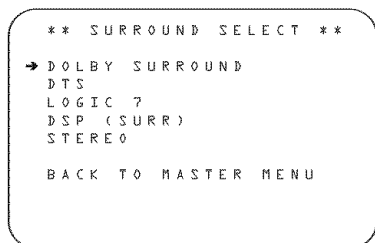


Figure 4

Each of the option lines on this menu (Figure 4) selects the surround mode category, and within each of those categories there will be a choice of the specific mode options.

The choice of modes will vary according to the speaker configuration in your system. When the **SURR BACK** line of the **SPEAKER SETUP** menu (Figure 6) is set to **NONE** the AVR 435 will be configured for 5.1-channel operation, and only the modes appropriate to a five-speaker system will appear. When the **SURR BACK** line of the **SPEAKER SETUP** menu (Figure 6) is set to **SMALL** or **LARGE**, the AVR 435 will be configured for 6.1/7.1-channel operation, and additional modes such as Dolby Digital EX and DTS-ES will appear, as they are only available when seven main speakers are present. In addition, some of the modes available in the AVR 435 will not appear unless a digital source is selected and is playing the correct bitstream.

To select the mode that will be used as the initial default for an input, first press the ▲/▼ **Navigation Button 15** until the on-screen cursor is next to the desired mode's master category name, such as **DOLBY SURROUND**, **DTS**, **DSP (SURR)** or **STEREO**. Next, press the **Set Button 17** to view the submenu. Press the ◀▶ **Navigation Button 15** to scroll through the available choices, and then press the ▼ **Navigation Button 15** so that the cursor is next to **BACK TO MASTER MENU** to continue the setup process.

The following few paragraphs detail the instructions needed for modes with multiple choices.

On the **DOLBY SURROUND** menu (Fig. 5), choices include Dolby Digital, Dolby Pro Logic II, Dolby Pro Logic IIx, Movie and Music, Dolby Pro Logic and Dolby Virtual Speaker Reference or Wide. For a complete description of the different Dolby Surround modes, see page 34. The Dolby Digital EX and Dolby Pro Logic IIx modes are only available when the system is set for 6.1/7.1 operation by configuring the Surround Back speakers to “Small” or “Large”, as described on page 28, or via EzSet/EQ. When a disc is playing with a Dolby Digital soundtrack that contains a special “flag” signal in the data stream, the Dolby Digital EX mode will be selected automatically. It may also be selected using this menu or through the front-panel or remote controls, as shown on page 33. A complete explanation of these modes is found on page 34.

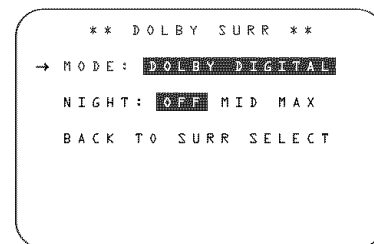


Figure 5

When the → cursor is pointing to the **MODE** line, press the ◀▶ **Navigation Buttons 15** to select the desired Dolby surround mode, again remembering that the choice of available modes will vary with the type of program material being played and the number of speakers in your system configuration.

When Dolby Pro Logic II Music or Dolby Pro Logic IIx Music is selected as the listening mode, three special settings are available to tailor the sound field to your listening room environment and your individual taste and preferences. (When other Dolby Surround modes are selected, dotted lines will indicate that these settings are not active.)

- **Center Width:** This setting adjusts the balance of the vocal information in the front soundstage between the center and front left/right speakers. The lower settings spread the center channel sound more broadly into the left and right channels. A higher number (up to “7”) produces a tighter center channel presentation.
- **Dimension:** This setting alters the perceived depth of the surround field by creating a shallower presentation that appears to move sounds toward the front of the room, or a deeper presentation that appears to move the center of the sound field toward the back of the room. The setting of “0” is a neutral default, with the range of adjustment shown as “R-3” for a deeper, rear-oriented sound to “F-3” for a shallower, front-oriented sound.
- **Panorama:** Switch this setting on or off to add an enveloping wraparound presentation that increases the perception of sound along the sides of the room.

To change these parameters, press the ▼/▲ **Navigation Buttons 15** while the **DOLBY SURROUND** menu is on the screen until the → cursor is pointing to the line on the menu with the parameter you wish to change. Then, press the ◀▶ **Navigation Buttons 15** to alter the setting to your taste.

When the **DOLBY DIGITAL** mode is selected, the Night mode settings are available, as shown in Figure 6.

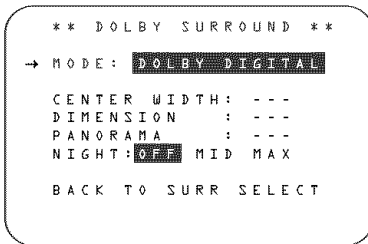


Figure 6

The Night mode is a feature of Dolby Digital that uses special processing to preserve the dynamic range and full intelligibility of a movie soundtrack while reducing the peak level. This prevents abruptly loud transitions from disturbing others, without reducing the sonic impact of a digital source. The Night mode is only available when specially encoded Dolby Digital signals are played.

To adjust the Night mode setting, make certain that the **→** cursor is on the **NIGHT** line of the **DOLBY** menu. Next, press **◀▶ Navigation Button 15** to choose between the following settings, as they appear in the on-screen display:

OFF: When **OFF** is highlighted, the Night mode will not function.

MID: When **MID** is highlighted, a mild compression will be applied.

MAX: When **MAX** is highlighted, a more severe compression algorithm will be applied.

We recommend that you select the **MID** setting as a starting point and change to the **MAX** setting later, if desired.

The Night mode may also be adjusted directly any time a Dolby Digital source is playing by pressing the **Night Mode Button 30**. When the button is pressed, **D-RANGE** will appear in the lower third of the video screen and in the **Lower Display Line 14**. Press the **▲/▼ Navigation Button 15** within 3 seconds to select the desired setting.

When all settings for the surround setup have been made, press the **▲/▼ Navigation Button 15** so that the **▶** cursor is next to **BACK TO MASTER MENU**, and press the **Set Button 17** to return to the **MASTER MENU**.

On the **DTS** menu, the selection choices made with the **◀▶ Navigation Button 15** on the remote are determined by a combination of the type of program material in use and whether the 5.1- or 6.1/7.1-channel configuration is in use.

When a DTS source is playing, the choice of modes for 7.1 systems will vary according to the type of

program source (DTS 5.1, DTS-ES Matrix or DTS-ES Discrete). Press the **◀▶ Navigation Button 15** to scroll through the choices that are available for your system and the program in use. The DTS Neo:6 Music mode is available with analog and PCM digital stereo sources and the DTS Neo:6 Cinema mode is available with analog matrix surround-encoded sources to deliver an enhanced 5.1-channel sound field.

When the 5.1 configuration is in use, the AVR will automatically select the 5.1 version of DTS processing when a DTS data stream is selected. When the 6.1/7.1 mode is selected, the DTS-ES Discrete mode will automatically be activated when a DTS source with the ES Discrete "flag" is in use. When a non-ES DTS disc is in use, you may select the DTS-ES Matrix mode through this menu to create a full eight-speaker surround mode. See page 34 for a complete explanation of the DTS modes.

On the **LOGIC 7** menu, the selections made with the **◀▶ Navigation Button 15** on the remote are determined by whether the 5.1- or 6.1/7.1-channel configuration is in use. In either case, the selection of a Logic 7 mode enables Harman Kardon's exclusive Logic 7 processing to create fully enveloping, multi-channel surround from either two-channel Stereo- or Matrix-encoded programming such as VHS cassettes, laser discs or television broadcasts produced with Dolby surround.

In the 5.1 configuration, you may select the Logic 7/5.1 Music or Cinema. They work best with two-channel music, surround-encoded programs or standard two-channel programming of any type, respectively. See page 34 for a complete explanation of the Logic 7 modes.

On the **DSP (SURR)** menu, the selection choices made with the **◀▶ Navigation Button 15** on the remote select from one of the DSP surround modes that are designed for use with two-channel stereo programs to create a variety of sound field presentations. The choices available are Hall 1, Hall 2 or Theater. The Hall and Theater modes are available in both five- and six-channel versions, depending on your system configuration. See page 34 for a complete explanation of the DSP surround modes.

On the **STEREO** menu, the selection choices made with the **◀▶ Navigation Button 15** on the remote may either turn off all processing and bass management for a traditional two-channel stereo presentation; select a stereo output with bass management; or select a **5 CH STEREO** and **7 CH STEREO** mode, depending on how many speakers are available. These two modes feed a two-channel presentation to all speakers. See page 34 for a complete explanation of the stereo modes.

To listen to an analog stereo source without any bass management, so that the left and right front speakers receive a full-range signal, straight through from the input gain section to the volume control, press the **◀▶ Navigation Button 15** so that **SURROUND OFF** appears in the highlighted video. To listen to two-channel analog sources while taking advantage of the AVR 435's bass-management system, press the **◀▶ Navigation Button 15** so that **SURROUND OFF+DSP** appears in the highlighted video.

After the selections are made on the Dolby, DTS, Logic 7, DSP (Surround) or Stereo menus, press the **▲/▼ Navigation Button 15** so that the cursor moves to the **BACK TO MASTER MENU** line and press the **Set Button 17**.

Using EzSet/EQ

The AVR 435 uses Harman Kardon's EzSet/EQ technology to automatically configure your system to deliver the best possible performance based on your specific speaker selection, where the speakers are placed in the room and the acoustic influences in your listening room. By using a series of test signals and the processing power of the Texas Instruments DA 610 digital signal processor, EzSet/EQ eliminates the need for manual adjustment of speaker "size", crossover, delay and output level settings while it adds the power of a multi-band parametric equalizer to smooth out the frequency settings for optimal sound reproduction.

In addition to making system setup quick and easy, EzSet/EQ is more precise than manual settings. With EzSet/EQ you are able to calibrate your system in a fraction of the time it would take to enter the settings manually, and with results that rival those achieved with expensive test equipment and time consuming procedures. The end result is a system calibration profile that enables your new receiver to deliver the best possible sound no matter what type of speakers you have or what the dimensions of your listening room are.

We recommend that you take advantage of the precision of EzSet/EQ to calibrate your system, but if desired you may also make any of the configuration settings manually, or trim the settings provided by EzSet/EQ by following the instructions on pages 26–31.

Before starting the EzSet/EQ process, make certain that you have connected all speakers for your system and that you have both the EzSet/EQ microphone and the extender rod handy. If you have a standard camera tripod, attach the extender rod to the tripod, and then screw the microphone to the top of the rod. Place the tripod at your primary listening position, at least three feet from the nearest speaker and adjust it so that microphone is at least three feet above ear level. If you do not have a tripod, simply screw the extender

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rod into the bottom of the EzSet/EQ microphone.

Next, plug the microphone into the **EzSet/EQ Microphone Jack J** located behind the **Front Panel Control Door 9**. The microphone cable is approximately 20 feet long, which should accommodate most listening room situations. If required, you may use an optional extension cable, available at most electronics stores, for use in larger rooms. However, we recommend that you make every effort to avoid using extension cords for the microphone cable as they may adversely affect the test results.

You are now ready to start the EzSet/EQ process by following these steps:

Step 1. Navigate to the **EZSET/EQ MODE** menu (Fig. 7) by first pressing the **OSD Button 31** on the remote. Press the **Navigation Button 15** until the **→** cursor is pointing to **EZSET/EQ** in the **MASTER MENU**. Press the **Set Button 17** to bring the menu to the screen.

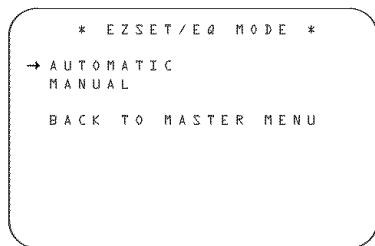


Figure 7

Step 2. Select one of the two options shown based on the way you wish to have the system settings entered:

- In most cases, you will want to use the Automatic mode, which calibrates the system for speaker presence, speaker "size", speaker crossover, channel output level, speaker-to-listener delay time and room equalization. To choose this mode simply press the **Set Button 17**, as the cursor is already pointing to Automatic when the menu appears on the screen.
- If you wish to enter the speaker crossover frequencies yourself, but want to have the EzSet/EQ system test for and calibrate all the other functions listed above, press the **Navigation Button 15** to point the cursor at **BACK TO MASTER MENU** and then press the **Set Button 17**. At the Master Menu, press the **Navigation Button 15** again so that the cursor is pointing to **MANUAL SETUP** and then press the **Set Button 17**. Once the **MANUAL SETUP** menu (Fig. 16) appears, follow the instructions on page 28 to enter your desired settings for the Crossover Frequencies, and then return to the **EZSET/EQ MODE** menu. Press the **Navigation Button 15** again

so that the cursor is pointing to **MANUAL** and then press the **Set Button 17**. When the interim message screen appears to remind you to set the crossovers, make sure that the cursor is pointing to **CONTINUE** and press the **Set Button 17** again since you have already set the crossovers.

Step 3. The **FAR FIELD MEASURE** screen (Figure 8) will appear with instructions to place the microphone, if you have not already done so. This screen is also the place to set the master volume level. As noted on the screen, use the **Volume Control 10/18** to adjust the volume level to **-28dB**, as shown on the line that appears at the bottom of the menu when the volume is adjusted. Press the **Set Button 17** when the volume is set to the proper level.

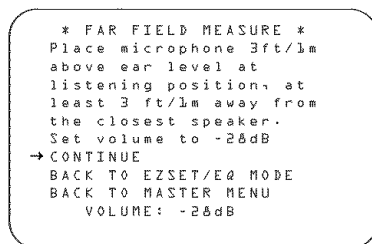


Figure 8

Step 4. The final menu screen before the EzSet/EQ process starts is a warning screen (Figure 9) that serves as a reminder to keep the room as quiet as possible while the system is in use. Extraneous noise of any kind may adversely affect the accuracy of the system's results. Do not talk while the test tones are circulating, and if possible, turn off any ventilation systems if the noise from the air flow is loud enough for you to hear. Should an outside noise such as a phone ringing occur during the test process, we recommend that you rerun EzSet/EQ. This screen is also your reminder that the test tones used by EzSet/EQ are somewhat loud. Anyone with sensitive hearing should leave the room or use hearing protection before moving to the next step. If you do not wish to start the test process at this time, press the **Navigation Button 15** to return to either the EzSet/EQ menu or the Master Menu, and press the **Set Button 17**. To begin the EzSet/EQ Near Field measurements, press the **Navigation Button 15** so that **ON** is highlighted in reverse video, and press the **Set Button 17**.

NOTE: Once the EzSet/EQ process starts, the volume control and Standby/Off switches are temporarily disabled while the tests are in progress. Do not adjust the volume or turn the unit off until you see the on-screen message change to indicate that EzSet/EQ is finished.

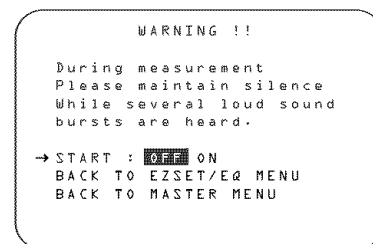


Figure 9

IMPORTANT NOTE: Anyone with hearing that is sensitive to loud noises should leave the room at this point, or use ear protection sufficient to reduce the noise level at their ears. Inexpensive foam-style ear plugs, available at most drug stores, may be used to reduce the sound level to a tolerable level for anyone who has a problem with loud noise. If you are uncomfortable with, or cannot tolerate loud sounds and do not use some sort of ear protection we strongly recommend that you leave the room and ask someone else to be present while the EzSet/EQ process takes place, or that you do not use EzSet/EQ and enter the configuration settings manually, as described on pages 26 through 31.

Step 5. At this point you will begin to hear a series of test tones circulate among all the speakers in your system. While this is happening, the AVR 435 is reading the signal to determine which speaker positions are active, what type of speaker is present at each active position, what the distance is from the listening position to each speaker, and to begin to build a profile of the impact of the room's acoustics on the quality of audio reproduction. When the test is completed you will hear the tones stop, and the system will pause for as long as a minute while the processor makes its calculations. Do not be alarmed if the "WARNING" message remains on the screen after tones stop until a results message is displayed as shown in Step 6 or 7, below.

NOTE: While these tests detect whether a speaker is connected to a particular output, they cannot determine whether the speaker is in the correct position. (For example, it can tell whether a speaker is connected to the Surround Right output, but it cannot tell whether the speaker is on the right or left side of your listening room.) For that reason, we strongly recommend that you try to listen as the tone circulates, matching the name shown for each channel to the location of the speaker. If a tone is heard from a speaker position that does not match the on-screen message, make a note of the incorrect speaker connections. When the test process stops you will see a message indicating the they Far Field measurements are complete, but since there is a connection error press the **Navigation Button 15** so that the on-screen cursor in Fig. 7 is pointing to **RETURN TO MASTER MENU**

and press the **Set Button** **17**. At this point, exit all menus and turn the receiver off. Check all speaker wire connections and then rerun EzSet/EQ.

Step 6. When the Far Field tests are complete a message screen will appear to confirm if the procedure was successful or not. In most cases there will not be any problems and you will see the message shown in Figure 10 on your screen. If the speaker positions shown match the actual speaker layout in your system, press the **Set Button** **17** to complete EzSet/EQ by performing the Near Field Measurements. Continue the EzSet/EQ process by pressing the **Set Button** **17** to take the Near Field measurements from the front left, center and right speakers. By taking this separate set of measurements, the AVR 435 is able to complete its view of the room's sonic signature and apply equalization as needed to correct spikes and dips in the system's response. Continue these instructions with Step 8.

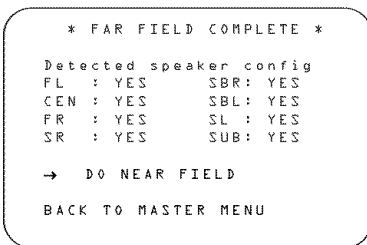


Figure 10

Step 7a. If the measurements are not successful due to a missing or malfunctioning speaker, the **FAR FIELD EQ ERROR** message will appear as shown in Figure 11. EzSet/EQ is programmed to look for speaker pairs at the front left/front right, surround left/surround right and surround back left/surround back right positions. If the test results indicate that one, but not both of the speakers in any of these pairs is present, the menu will show NO next to the speaker position where the tests did not report back that a speaker is present. Should this message appear, make note of the suspect speaker location, exit all menus and turn the receiver off. Check all speaker wire connections and then rerun EzSet/EQ.

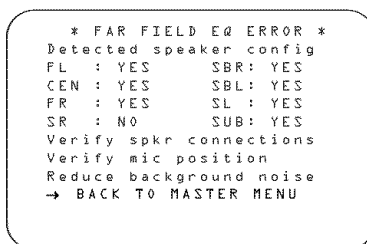


Figure 11

Step 7b. In some cases, the system may not function properly due to overly high output levels. When this occurs, you will see the message shown in Figure 12. If you see this message verify that the microphone is in the correct position, and not too close to any one speaker. Then press the **Set Button** **17** to go back to the **MASTER MENU**. From there, return to the EzSet/EQ system and when you are once again at the **FAR FIELD MEASURE** screen, reduce the system volume level by 3dB before trying EzSet/EQ again.

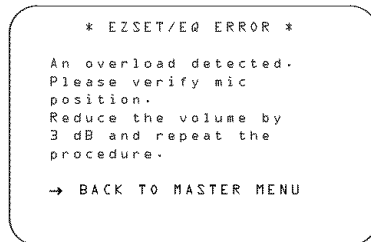


Figure 12

Step 8. When the Far Field measurements are completed, the system will ask you to take three Near Field measurements, one at each front speaker position. These measurements enable EzSet/EQ to produce the most accurate settings for both high and low frequency equalization. The Near Field measurements are similar to the Far Field tests, except that the system will "listen" to only one speaker at a time, rather than sending the test signals to all speakers in rotation. At the **NEAR FIELD EQ SELECT** menu (Figure 13), you will see an instruction to place the microphone in a different position than the one used for the initial Far Field measurements. This time, place the microphone close to the speaker to be measured, at a distance of about 3 feet. In addition, the top of the microphone should be pointed towards the speaker, rather than pointing up as was done for the Far Field tests. For the first measurement, place the microphone so that it is close to, and pointing towards, the front left speaker, and with the on-screen → cursor pointing to **1. FL SPEAKER**, and press the **Set Button** **17**.

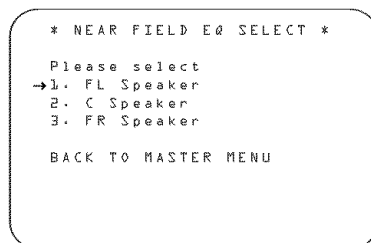


Figure 13

Step 9. You will now see a Warning message similar to the one shown in Figure 7 except that it will contain an option to return to the **NEAR FIELD EQ SELECT** menu (Figure 13) as well as the ability to return to the **MASTER MENU**. If you are ready to proceed with the test, make certain that the microphone is properly pointed toward the speaker selected for calibration, press the **Navigation Button** **15** so that **0N** is highlighted and press the **Set Button** **17**.

Step 10. One short test signal will be sent to the speaker position being calibrated and after a slight pause from the system to calculate the test results, you will see either a "Near Field Complete" message or a "Near Field Error" message. In most cases, the "Complete" message will appear, in which case you should proceed to Step 11, if an "Error" message appears, go to Step 12.

Step 11. If the test results were successful, the message shown in Figure 14 will appear. In order to properly calibrate the system, you will need to run the Near Field tests for all three front channel speakers (left, center and right). After running the test for the front left speaker, make certain that the cursor is pointing towards **BACK TO NEAR FIELD** and press the **Set Button** **17**. When you are taken back to the Near Field Select menu (Figure 13) where you should repeat Steps 8 through 11 until all three front speakers have been calibrated. When that is done the EzSet/EQ process is complete and you should press the **Navigation Button** **15** to return to the Master Menu.

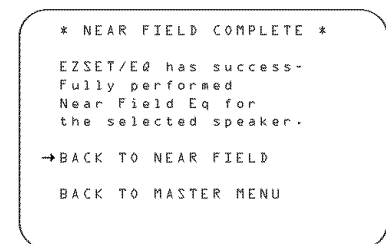


Figure 14

Step 12. If a "Near Field Error" message appears, as shown in Figure 15, you should check to make certain that the microphone is about three feet from the speaker being tested and that the top of the microphone unit is pointing towards the speaker. You may also have to raise or lower the master volume to achieve accurate readings. After checking these two items, as needed, make certain that the cursor is pointing to the **BACK TO NEAR FIELD** line and press the **Set Button** **17**. This will return you to the **NEAR FIELD EQ SELECT** menu (Figure 13) where you should repeat Steps 8 through 11, adjusting the mike placement and volume

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level as needed until the **NEAR FIELD COMPLETE** menu (Figure 14) appears after the test tone stops.

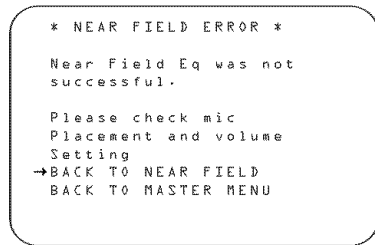


Figure 15

When both the Far Field and Near Field measurements have been successfully completed your system is ready for use. Thanks to EzSet/EQ, the settings for speaker "size", speaker crossover, channel output and individual channel delay time have been automatically set and require no further adjustment. In addition, EzSet/EQ also performs a complete room equalization that tailors the system's performance for the best possible sound with your combination of speakers, speaker placement and room acoustics. The next few pages in this manual detail the procedure for manually entering system data, but unless you want to view the setting information and make an adjustment, you are now ready to enjoy the finest in home theater and music reproduction. Go to page 32 for complete information on operating your AVR 435.

Manual Setup

In most cases it is simpler, easier and more accurate to let EzSet/EQ take care of entering the system parameters for speaker "size", speaker crossover, channel output and individual channel delay time. However, if you feel that your listening room or system components are best suited to manual entry of these settings, the AVR 435 also allows you to enter or trim any of these traditional system parameters. Even if you do make the settings manually, we recommend that you run the EzSet/EQ tests first so that a baseline setting is established, and then make your adjustments from there. Note that once EzSet/EQ has been run you do not need to adjust all system settings, only those that you want to adjust.

To view or change the current settings, press the **OSD Button 31** on the remote to bring up the **MASTER MENU** (Figure 1). Next, press the **Navigation Button 15** as needed until the cursor is on the **MANUAL SETUP** line. Press the **Set Button 17** to view the **MANUAL SETUP** menu (Figure 16).



Figure 16

If you have already run the EzSet/EQ calibration system, the first line of the menu enables you to hear the difference between the settings established by EzSet/EQ. The default setting is **ON**, which plays the incoming source with the EzSet/EQ settings. To hear the system in a Bypass mode, with none of the equalization filters in the circuit path, press the **Navigation Button 15** so that **OFF** is highlighted. Note that once changed, this setting will remain until you change it again in this menu. While you may want to use this menu option to hear the difference that EzSet/EQ makes, we recommend that you leave the setting on to take advantage of the benefits of EzSet/EQ's advanced room correction technology.

The **EZSET ADJUST** line on the menu enables you to set the system's Tilt, or high-frequency boost. To make this adjustment, first make sure that **EZSET EQ** line is set to **ON**, as this item is not available when EzSet EQ is not in the signal path. When the cursor is on the **EZSET ADJUST** line, press the **Set Button 17** and then press the **Navigation Button 15** to enter the desired setting. When you have completed your adjustment, press the **Navigation Button 15** to move the cursor down to the **BACK TO MANUAL SETUP** line and press the **Set Button 17**.

Note on Manual Setup Menus: Each of the four major manual setup menus (Speaker Size, Speaker Crossover, Delay Adjust and Channel Adjust) includes a line that reads **EZSET SETTINGS**. When the default setting of **OFF** is shown you are able to make any required adjustments that are available on that menu. However, you may change the setting to **ON** at any time to recall the settings established when EzSet/EQ was last run. It is also important to note that when the EzSet/EQ settings are in use, the AVR will not allow any changes to be made. To trim the settings press the **Navigation Button 15** until the cursor is on the **EZSET SETTINGS** line on the menu in use and press the **Navigation Button 15** to change the setting to **OFF**. This will allow you to make changes to the settings on that menu.

Speaker Setup

Although using EzSet/EQ to enter the settings for speaker "size" and crossover point, you may wish to make changes to those settings, or to manually enter a complete speaker profile for your system. In addition, for systems where you wish to have separate speaker configuration settings for each input, rather than use the same settings for all inputs, you may also configure that option in these menus. Two separate menus are used to enter this information, and you may change the data on either or both, as needed.

The **SPEAKER SIZE** menu tells the AVR about the bass reproduction capabilities of your speakers. This, in turn, determines which speakers receive bass information that is derived from audio tracks or specifically intended for reproduction by low-frequency-capable speakers by the use of a low-frequency effects ("LFE") channel in digital program sources. In addition, by telling the AVR whether speakers are available for the Surround Back channels, the information on this menu is used to determine which surround modes may be used (e.g., modes such as Dolby Digital EX, Dolby Pro Logic IIx, or DTS-ES, requiring SBL/SBR speakers, are only available when a speaker is present in those channels).

The **SPEAKER X-OVER** menu is used to further tailor the bass management system by determining the frequencies at which bass information is sent to a specific speaker position. This menu also contains settings to route LFE information and to set the subwoofer high-pass filter order.

To configure the speakers in your system for use with the AVR 435, or to check the settings entered by EzSet/EQ, check the settings on the various sub-menu groups on the **MANUAL SETUP** menu, starting with the **SPEAKER SIZE** menu (Figure 17) and then check the other menus' settings. To do this, go to the Manual Setup Menu (Figure 16) by first pressing the **OSD Button 31** to recall the Master Menu (Figure 1). Next, press the **Navigation Button 15** until the cursor is on the **MANUAL SETUP** line on the menu in use and press the **Set Button 17**. When the **MANUAL SETUP** Menu is shown, press the **Navigation Button 15** again until the cursor is on the **SPEAKER SIZE** line and press the **Set Button 17**.

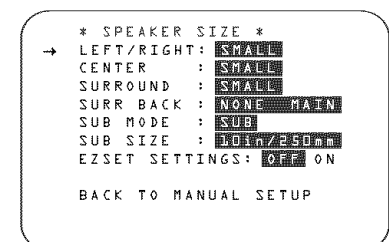


Figure 17

On the **SPEAKER SIZE** menu (Figure 17), you will see either the factory default settings or, if EzSet/EQ has been run, the settings recorded by the test results. In the case for the main speaker channels, each speaker position (front left/right, center, surround left/right and surround back left/right) you have the option of telling the system if the speakers used are "small" or "large". These descriptions do not describe the actual physical size of the speakers, but rather refer to the type of speaker. For each of these settings, select **LARGE** when the speakers in a particular position are traditional full-range loudspeakers. Use the **SMALL** setting for smaller, frequency-limited "satellite" speakers that do not reproduce sounds below 60Hz. In all cases except the front left/right speakers you may also select **NONE**. This tells the system that no speakers are present at the particular position, allowing the AVR to select the correct surround modes that are compatible with the number of speakers installed. For example, in order to use the Dolby Digital EX, Dolby Pro Logic IIx, DTS-ES Logic 7/7-channel and 7 Stereo modes, you must have either Large or Small speakers entered as the setting for the Surround Back channels.

If you are in doubt as to which setting best describes your speakers consult the specifications in the speakers' owner's manual, visit the speaker manufacturer's web site or ask the dealer or installer from whom you purchased the speakers.

Begin your changes to the speaker setup process by making certain that the cursor is pointing at the **LEFT/RIGHT** line, which sets the configuration for the front left and right speakers. If you wish to make a change to the front speakers' configuration, press the **◀▶ Navigation Button 15** so that either **LARGE** or **SMALL** appears, matching the appropriate description from the definitions shown above.

IMPORTANT NOTE: If a change is made to this, or any speaker position, when you press the **◀▶ Navigation Button 15**, an on-screen warning message will appear reminding you that EzSet/EQ must be run. This is necessary to integrate the changed parameter with the EzSet/EQ test results. Make all desired setting changes on the **SPEAKER SETUP** and **SPEAKER X-OVER** menus once, and then run EzSet/EQ after all manual adjustments are completed.

When **SMALL** is selected, low-frequency sounds will be sent only to the subwoofer output. If you choose this option and there is no subwoofer connected, you will not hear any low-frequency sounds from the front channels.

When **LARGE** is selected, a full-range signal will be sent to the front left and front right outputs. Depending on the choice made in the **SUBWOOFER** line in

this menu, bass and/or LFE information may also be directed to the subwoofer.

When you have completed your selection for the front channel, press the **▼ Navigation Button 15** on the remote to move the cursor to **CENTER**.

Press the **◀▶ Navigation Button 15** on the remote to select the option that best describes your system, based on the speaker definitions shown below.

When **SMALL** is selected, low-frequency center channel sounds will be sent only to the subwoofer output. If you choose this option and there is no subwoofer connected, you will not hear low-frequency sounds from the center channel.

When **LARGE** is selected, a full-range signal will be sent to the center speaker output, and NO center channel signal will be sent to the subwoofer output.

When **NONE** is selected, no signals will be sent to the center channel output. The receiver will operate in a "phantom" center channel mode and center channel information will be sent to the left and right front channel outputs. When only front left and right speakers are used, with no center or surround speakers, Dolby Virtual Speaker is a good alternative mode.

When you have completed your selection for the center channel, press the **▼ Navigation Button 15** on the remote to move the cursor to **SURROUND**.

Press the **◀▶ Navigation Button 15** on the remote to select the option that best describes the surround speakers in your system based on the speaker definitions shown on this page.

When **SMALL** is selected, low-frequency surround channel sounds will be sent to the subwoofer output only. If you choose this option and there is no subwoofer connected, you will not hear any low-frequency sounds from the surround channels.

When **LARGE** is selected, a full-range signal will be sent to the surround channel outputs, and NO surround channel signals will be sent to the subwoofer output.

When **NONE** is selected, surround sound information will be split between the front left and front right outputs. For optimal performance when no surround speakers are in use, the Dolby Virtual Speaker mode should be used.

When you have completed your selections for the main surround channels, press the **▼ Navigation Button 15** on the remote to move the cursor to **SURR BACK**. This line serves two functions: It not only configures the setting for the surround back channels when they are present; it also tells

the AVR 435's processing system to configure the unit for either 5.1 or 6.1/7.1 operation.

Press the **◀▶ Navigation Button 15** on the remote to select the option that best describes the speakers in use at the left and right back surround positions based on the definitions on this page:

When **NONE** is selected, the system will adjust so that only 5.1-channel surround processing/decoding modes are available and the surround back amplifier channels will not be used. When this is the case for your system, you may wish to take advantage of the availability of this amplifier channel pair for use in powering a second set of speakers that have their source selected by the AVR 435's multiroom control system. See page 41 for more information.

When **SMALL** is selected, the system will adjust so that the full complement of 6.1/7.1 surround processing/decoding modes are available, and low-frequency information below the crossover point will be sent to the subwoofer output. If you choose this option and there is no subwoofer connected, you will not hear any low-frequency sounds from the surround back channels.

When **LARGE** is selected, the system will adjust so that the full complement of 6.1/7.1 surround processing/decoding modes are available, and a full-range signal will be sent to the surround back channels, with no low-frequency information sent to the subwoofer output.

When you have completed your selection for the back surround channels, press the **▼ Navigation Button 15** on the remote to move the cursor to **SUB MODE**.

Press the **◀▶ Navigation Button 15** on the remote to select the option that best describes your system.

The choices available for the subwoofer position will depend on the settings for the other speakers, particularly the front left/right positions.

If the front left/right speakers are set to **SMALL**, the subwoofer will automatically be set to **SUB**, which is the "on" position.

If the front left/right speakers are set to **LARGE**, three options are available:

- If no subwoofer is connected to the AVR 435, press the **◀▶ Navigation Button 15** on the remote so that **NONE** appears in the on-screen menu. When this option is selected, all bass information will be routed to the front left/right "main" speakers.

SYSTEM CONFIGURATION

- If a subwoofer is connected to the AVR 435, you have the option to have the front left/right "main" speakers reproduce bass frequencies at all times, and have the subwoofer operate only when the AVR 435 is being used with a digital source that contains a dedicated low-frequency effects, or LFE soundtrack. This allows you to use both your main and subwoofer speakers to take advantage of the special bass sounds created for some movies. Press **◀/▶ Navigation Button 15** on the remote so that **SUB (LFE)** appears in the on-screen menu.
- If a subwoofer is connected and you wish to use it for bass reproduction in conjunction with the main front left/right speakers, regardless of the type of program source or Surround mode you are listening to, press the **◀/▶ Navigation Button 15** on the remote so that **SUB L/R+LFE** appears in the on-screen menu. When this option is selected, a full-range signal will be sent to the front left/right "main" speakers, and the subwoofer will receive LFE information and the bass frequencies under the selected crossover point.

After making any required changes to the Subwoofer Mode line, press the **▲/▼ Navigation Button 15** to move the cursor to the **SUB SIZE** line. The setting on this line enters the data of the size of your subwoofer's driver so that the proper gain, filters and equalization settings will be used with EzSet/EQ.

To change the setting, make certain that the cursor is on the **SUB SIZE** line and press the **▲/▼ Navigation Button 15**, so that the setting appears that matches the diameter of your subwoofer's driver. If you do not remember what the size is, you can either measure the driver's diameter or consult the owner's manual for the speaker.

When you have completed the settings for speaker "size", press the **▲/▼ Navigation Button 15** to move the cursor to the **BACK TO MANUAL SETUP** line to continue your adjustments. It is also important to remember to re-run the EzSet/EQ system if any changes have been made to the settings on this menu, following the instructions shown on page 24 for using the Manual mode.

Speaker Crossover Setting

When all speaker "size" settings have been made, you now have the option to take advantage of the AVR 435's Quadruple Crossover system, which allows individual crossover settings to be made for each speaker grouping. The low-frequency crossover point is set by the design of your speakers. Depending on the design and driver complement of your speakers, it is defined as the frequency which is either the lowest possible frequency the speaker is capable of reproducing, or the frequency at which sound is sent to the

speaker's internal low-frequency driver, as opposed to the mid-range driver. The settings on the **SPKR X-OVER** menu also allow you to set the high pass filter that determines which frequencies go to the subwoofer when the AVR 435 is playing back the low frequency effects (LFE) channel from a digital soundtrack.

Before making any changes to the settings on this display, we suggest that you find the crossover point for the speakers in each of the four groupings, and the highest frequency handled by your subwoofer as well as the order of its filter slope. front left/right, center front, surround and surround back, by looking at the specifications page of each speaker's owner's manual, by getting that information from the speaker manufacturer's Web site, or by contacting your dealer or the manufacturer's customer service department. You will need these figures to accurately configure the next group of settings.

Note that when any speaker group other than the front left/right speakers is set to **LARGE**, the crossover may not be adjusted, as the feed will be full-range, with no sound being derived from the subwoofer at that position.

To make changes to the speaker crossovers or LFE high-pass filter setting, go to the **SPKR X-OVER** submenu within the **MANUAL SETUP** menu (Fig. 16). To do this, first press the **OSD Button 31** so that the **MASTER MENU** (Figure 1) appears. Next, press the **◀/▶ Navigation Button 15** until the cursor is on the **MANUAL SETUP** line on the menu in use and press the **Set Button 17**. When the **MANUAL SETUP** menu is shown, press the **◀/▶ Navigation Button 15** again until the cursor is on the **SPEAKER X-OVER** line and press the **Set Button 17** to view the **SPKR X-OVER** menu (Figure 18).

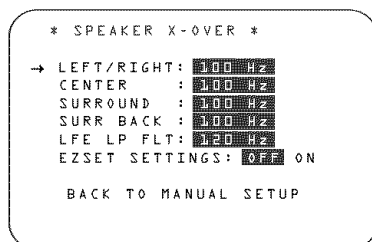


Figure 18

To change the setting for any of the four speaker groups, press the **▲/▼ Navigation Button 15** until the cursor is next to the speaker group where you wish to make a change and then press the **◀/▶ Navigation Button 15** until the desired setting appears. The available choices for low-frequency information to be sent to the subwoofer, rather than to the main speaker channel, are 40Hz, 60Hz, 80Hz, 100Hz, 120Hz, 150Hz and 200Hz. Pick the choice

that is identical to the information for the speakers, or if an exact match is not possible, pick the closest choice that is ABOVE the speaker's low-frequency limit or crossover point to avoid the creation of a low-frequency "hole" where your system will have no bass information.

When any needed adjustments are made to the crossovers, one additional adjustment is available to custom tailor the way information is sent to the subwoofer. The **LFE LP FLT** line adjusts the frequency cutoff of the low pass filter that determines the frequency at which information is sent to the subwoofer when playing a digital soundtrack that has a dedicated low frequency effects channel. In most cases the default frequency of 120Hz is appropriate, since that is the frequency most commonly used in the creation of LFE channels during a movie's sound mixing process. However, you may wish to change the setting based on your individual preference or the characteristics and capabilities of your subwoofer.

To change this setting when the **SPEAKER X-OVER** menu is on the screen, press the **▲/▼ Navigation Button 15** until the cursor is on the **LFE LP FLT** line and then press the **◀/▶ Navigation Button 15** until the desired setting is shown in highlighted video.

When all changes to Speaker Crossover settings have been made, press the **▲/▼ Navigation Button 15** until the cursor is on the **BACK TO MANUAL SETUP** menu and then pressing the **Set Button 17** so that you may make any other adjustments to the system parameters. It is also important to remember to rerun the EzSet/EQ system if any changes have been made to the settings on this menu, following the instructions shown on page 24 for using the Manual mode.

Delay Settings

Due to the different distances between the listening position and each speaker position, the amount of time it takes for sound to reach your ears from each channel is different. You may compensate for this difference through the use of the delay settings to adjust the timing for the speaker placement and acoustic conditions in your listening room or home theater.

In most cases, the settings established by EzSet/EQ are accurate to under a foot, but the placement of the microphone and other factors may influence the setting. Should you wish to manually adjust the channel delay times, follow the instructions shown below. Whenever adjustments to the delay settings are made remember that the distance settings need not be accurate to the inch, as the system is designed to accommodate a typical listening area rather than the precise measurement from the speakers to a specific "sweet spot" position.

In addition to providing delaying adjustments for each individual speaker position, the AVR 435 is among the few A/V receivers that allows you to adjust the delay for the combined output of all speakers as a group. This feature is called A/V Sync Delay; it allows you to compensate for delays to the video image that may be caused by the processing in products such as digital video displays, video scalars, digital cable or satellite systems, or personal video recorders. With proper adjustment of the setting for A/V Sync Delay, you can eliminate the loss of lip sync that may be caused by digital video applications.

To make any changes to the delay settings, go to the **DELAY ADJUST** submenu within the **MANUAL SETUP** menu (Figure 16). To do this, first press the **OSD Button 31** so that the **MASTER MENU** (Figure 1) appears. Next, press the **▲/▼ Navigation Button 15** until the cursor is on the **MANUAL SETUP** line on the menu in use and press the **Set Button 17**. When the **MANUAL SETUP** menu is shown, press the **▲/▼ Navigation Button 15** again until the cursor is on the **DELAY ADJUST** line and press the **Set Button 17** to view the **DELAY ADJUST** menu (Figure 19).

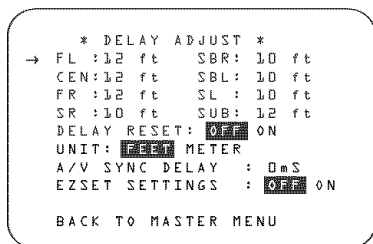


Figure 19

If you are using this menu for the first time, press the **▼ Navigation Button 15** to proceed to the next step, as no reset is needed. However, if you are returning to this menu to change the current settings, you may wish to reset all channels to the factory default distances before entering new data.

To reset the settings, make certain that the cursor is on the **DELAY RESET** line and then press the **◀/▶ Navigation Buttons 15** so that **ON** is shown in highlighted video and note that the factory defaults will appear. Press the **▲ Navigation Button 15** to scroll back up into the channel listings to make your adjustments following the instructions shown above Figure 19. When your first setting change is made, **OFF** will automatically be highlighted on the **DELAY RESET** line to indicate that the change has been made.

The default for distance settings on this menu is in feet. If your measurements are in feet, proceed to the next step; if your measurements are made in meters,

press the **▼ Navigation Button 15** until the on-screen **→** cursor is at the **UNIT** line on the menu. Then, press the **◀/▶ Navigation Button 15** so that **METER** is highlighted. When the change in measurement units is made, press the **▲/▼ Navigation Button 15** to return the **→** cursor to the **FL** position.

With the on-screen **→** cursor pointing to **FL**, press the **◀/▶ Navigation Button 15** until the distance from the center speaker to the preferred listening position is entered. Next, press the **▼ Navigation Button 15** to move the cursor to the **NEXT** line and use the **◀/▶ Navigation Button 15** again to enter the distance from the main listening position to the center speaker. Repeat the procedure for all active speaker positions, first using the **▼ Navigation Button 15** to change to the next position, and then use the **◀/▶ Navigation Button 15** to change the setting. Note that only the speaker positions that have been set to **LARGE** or **SMALL** in the **SPEAKER SETUP** menu, as shown on page 26, may be adjusted. The appearance of three dashes next to a speaker position in place of a distance setting indicates that you have not configured an active speaker for that location.

When the delay time for all speaker positions has been set you may return to the manual setup by pressing the **▲/▼ Navigation Button 15** until the **→** cursor is pointing to **BACK TO MANUAL SETUP** and then pressing the **Set Button 17**. However, if you have a digital video source or a digital video display that causes lack of lip sync you may use the A/V Sync adjust feature to delay the audio signal as it is sent to *all* channels (as opposed to the individual settings) so that the picture and sound are brought back together. We recommend that this adjustment be made using the direct access controls on the remote, as shown below. That enables you to see the image while making the adjustment; however, you may also adjust it here using the menu system.

To adjust the A/V Sync delay, press the **▲/▼ Navigation Button 15** so that the **→** cursor is pointing to the **A/V SYNC DELAY** line on the menu and then press the **◀/▶ Navigation Button 15** to delay the sound sufficiently so that it matches the on-screen video.

The delay settings may be adjusted at any time using the remote control and while viewing an on-screen image by pressing the **Delay Select Button 37**. The A/V Sync Delay setting is first, and it may be adjusted by pressing the **Set Button 17** within five seconds of when the **A/V SYNC DELAY** message appears in the on-screen display and the **Lower Display Line 14**. Then, press the **◀/▶ Navigation Button 15** to enter the desired delay

setting that brings the video and sound back in sync. Press the **Set Button 17** again to enter the setting.

Note that the A/V Sync delay setting is unique to each video input source, so you may enter a different setting to compensate for the differences between any product attached to the different inputs.

To change one of the individual speaker positions directly, press the **Speaker Select Button 38**, followed by the **▲/▼ Navigation Button 15** to select the desired position as that name appears in the on-screen display and the **Lower Display Line 14**. When the name of the speaker position to be adjusted appears press the **Set Button 17** within 5 seconds. Press the **◀/▶ Navigation Button 15** to enter the desired delay setting for that speaker and then press

the **Set Button 17** to enter the setting. The **▲/▼ Navigation Button 15** may be used to select another position, or you may simply wait 5 seconds for the system to time out and return to normal operation.

When all changes to the Delay settings have been made press the **▲/▼ Navigation Button 15** until the cursor is on the **BACK TO MANUAL SETUP** menu and then pressing the **Set Button 17** so that you may make any other adjustments to the system parameters. If the changes just made complete the manual adjustments needed, press the **OSD Button 31** to exit the menu system and resume normal system operation.

Output Level Adjustment

Output level adjustment is a key part of the configuration of any surround sound product. It is particularly important for a digital receiver such as the AVR 435, as correct outputs ensure that you hear soundtracks with the proper directionality and intensity.

In most cases, you will not need to make any adjustments to the output level, as the settings made by running EzSet/EQ are as accurate as those made manually. However, you are able to use the **CHANNEL ADJUST** menu to trim the settings to suit your personal preferences or to configure the system so that the output settings are different from one input source to another. The ability to make individual output level adjustments on a per-input basis is useful for listeners who may prefer different settings for the subwoofer or an individual channel group such as the front speakers when playing musical selections via the CD input as opposed to the movie soundtracks more frequently used with the DVD input. This menu also allows you to adjust the output levels using external sources such as a test disc or other program material that you use as a standard, rather than the system's test tone.

SYSTEM CONFIGURATION

IMPORTANT NOTE: Listeners are often confused about the operation of the surround channels. While some assume that sound should always be coming from each speaker, most of the time there will be little or no sound in the surround channels. This is because they are only used when a movie director or sound mixer specifically places sound there to create ambience, a special effect or to continue action from the front of the room to the rear. When the output levels are properly set, it is normal for surround speakers to operate only occasionally. Artificially increasing the volume to the rear speakers may destroy the illusion of an enveloping sound field that duplicates the way you hear sound in a movie theater or concert hall, even when making manual adjustments.

Before beginning the output level adjustment process, make certain that all speaker connections have been properly made. The system volume should be set to the level that you will use during a typical listening session. We recommend that EzSet/EQ be used when the AVR is first installed to establish the initial level settings.

To make any changes to the channel output settings, go to the **CHANNEL ADJUST** sub-menu within the **MANUAL SETUP** Menu (Figure 16). To do this, first press the **OSD Button 31** so that the **MASTER MENU** (Figure 1) appears. Next, press the **▲/▼ Navigation Button 15** until the cursor is on the **MANUAL SETUP** line on the menu in use and press the **Set Button 17**. When the **MANUAL SETUP** menu is shown, press the **▲/▼ Navigation Button 15** again until the cursor is on the **CHANNEL ADJUST** line and press the **Set Button 17** to view the **CHANNEL ADJUST** menu (Figure 20).

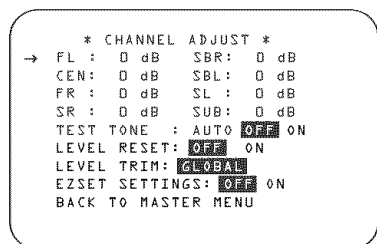


Figure 20

To provide the maximum flexibility, channel output level adjustments may be made either with or without the internal test tone, and when the tone is in use it may be programmed to automatically circulate among the active channels or to only move from one channel to the next on your command. When the **CHANNEL ADJUST** menu first appears we recommend that you always run the test tone once the automatic mode to verify that the speakers have been properly connected. To do this, press the **◀/▶ Navigation Button 15** again until the cursor is on the **TEST TONE**

line and then press the **◀/▶ Navigation Button 15** until **AUTO** is in highlighted video. This will cause the test tone to circulate among all of the channels for five seconds at each position.

As the test tone circulates, the cursor will flash and move next to each position to indicate where the tone should be coming from. If the tone is coming from a different speaker than the one indicated on the menu screen turn the AVR 435 off using the **Main Power Switch A** and check the speaker wiring or connections to external power amplifiers to make certain that each speaker is connected to the correct output terminal. When you have verified that all speakers are connected to the correct output terminal, turn the AVR 435 back on and return to this menu to resume the channel adjustment procedure. If any speaker connections were changed we also recommend that you rerun EzSet/EQ before making any manual calibration adjustments.

After checking for speaker placement, let the test noise circulate again, and listen to see which channels sound louder than the others. Using the front left speaker as a reference, press the **◀/▶ Navigation Button 15** on the remote to bring all speakers to the same volume level. When the **◀/▶ Navigation Button 15** is pushed, the test noise circulation will pause on the channel being adjusted to give you time to make the adjustment. When you release the button, the circulation will resume after five seconds.

Continue to adjust the individual channels until the volume level sounds the same from each speaker. Adjustments should be made with the **◀/▶ Navigation Button 15** on the remote only, NOT the main volume controls. If you are using a sound-pressure level (SPL) meter for precise level adjustment, set the volume so that the meter reads 75dB, C-Weighting Slow.

When all channels have an equal volume level, the adjustment is complete. To exit this menu, press the **▲/▼ Navigation Button 15** until the cursor is next to the **BACK TO MASTER MENU** line, and then press the **Set Button 17** to return to the **MASTER MENU**.

In addition to having the test tone circulate automatically, you may also turn the test tone on, but advance it from one channel to the next manually. This allows you to make calibration adjustments, but to have more control over the way the test tone is moved among the channels.

To change the tone manually, first make certain that the **CHANNEL ADJUST** menu is on the screen, following the instructions shown above, and then press the until the cursor is on the **TEST TONE** line. Next, press the **◀/▶ Navigation Button 15** until **MAN** is in highlighted video. This

will start the test tone from the front left speaker position, but rather than circulating to the next channel every five seconds, as is the case in the automatic mode, the you must press the **▲/▼ Navigation Button 15** to change the channel the test tone is being sent to. When you have circulated through all channels the test tone will stop, but you may restart it by returning to the **TEST TONE** line again and activating manual sequencing.

The final option for tone adjustment using the menu system is to not use the internal test tone at all. To do this, simply use the **▲/▼ Navigation Buttons 15** to change the channel and then use the **◀/▶ Navigation Buttons 15** to change the output level. When making channel output adjustments without the internal test tone we strongly recommend that you use a test disc in the "repeat" mode on your DVD or CD player so that the signal being used is constant throughout the adjustment process.

The output levels may also be adjusted at any time using the remote control and semi-OSD system. To adjust the output levels in this fashion, press the **Test Button 6**. As soon as the button is pressed, the test tone will begin to circulate as indicated earlier. The correct channel from which the test noise should be heard will be shown in the lower third of the video screen and in the **Lower Display Line 14**. While the test noise is circulating, the proper channel position will also be indicated in the **Speaker/Channel Input Indicators 12** by a blinking letter within the correct channel.

To adjust the output level, press the **▲/▼ Navigation Button 15** until the desired level is shown in the display or on screen. Once the buttons are released, the test noise will begin to circulate again in five seconds.

When all channels have the same output level, press the **Test Button 6** again to complete the process.

NOTE: Output level adjustment with the test tone is not available in the Surround Off modes.

You may have the output levels remain the same for all inputs or to be adjusted differently for each (or any) input. While most listeners prefer to keep the same output levels for all sources, you may wish to raise or lower some channels, particularly the subwoofer output for a specific source such as a CD that is primarily used for music playback.

To enter individual settings for a specific input, first make sure that you have either run EzSet/EQ and/or made any desired manual trim adjustments to set a baseline for all channels. After that is done, press the **OSD Button 31** to exit the menu system and then select the input for which you wish to enter different

level settings by using either the **Input Source Selectors 7** on the front panel or the buttons on the remote that are used to select an input source **4 33 44 C D**. Next, return to the **CHANNEL OUTPUT** submenu using the steps outlined above.

At the **CHANNEL OUTPUT** menu press **▲/▼ Navigation Button 15** until the cursor is pointing to the **LEVEL TRIM** line and then press the **▲/▼ Navigation Button 15** once so that **INDEPENDENT** appears in highlighted video. When this setting is active you may change the channel output levels for any input without changing the settings previously established for another.

To return to the settings established by EzSet/EQ, even if you have made manual changes to the output trims using the steps shown above, press **▲/▼ Navigation Button 15** so that the cursor is pointing to the **EZSET SETTINGS** line and then press the **▲/▼ Navigation Button 15** once so **ON** appears in highlighted video. Remember that after turning the EzSet/EQ settings back on you must turn return to this menu line and change the setting to **OFF** if you wish to make any manual trim adjustments.

When all changes to the Channel Output levels and the associated level trim settings have been made press the **▲/▼ Navigation Button 15** until the cursor is on the **BACK TO MANUAL SETUP** menu and then pressing the **Set Button 17** so that you may make any other adjustments to the system parameters. If the changes just made complete the manual adjustments needed, press the **OSD Button 31** to exit the menu system and resume normal system operation.

Additional Input Adjustments

After one input has been adjusted for Surround mode, digital input (if any), speaker type, and output levels, go back to the **INPUT SETUP** line on the **MASTER MENU** (Figure 1) and enter the settings for each input that you will use. In most cases, only the digital input and surround mode will be different from one input to the next, while the speaker type, crossover frequency, Night mode and output level settings will usually be the same and may be quickly entered by entering the same data used for the original input.

Once the settings outlined on the previous pages have been made, the AVR 435 is ready for operation. While there are some additional settings to be made, these are best done after you have had an opportunity to listen to a variety of sources and different kinds of program material. These advanced settings are described on pages 39 and 40 of this manual. In addition, any of the settings made in the initial configuration of the

unit may be changed at any time. As you add new or different sources or speakers, or if you wish to change a setting to better reflect your listening taste, simply follow the instructions for changing the settings for that parameter as shown in this section.

Having completed the setup and configuration process for your AVR 435, you are about to experience the finest in music and home theater listening. Enjoy!

OPERATION

Basic Operation

Once you have completed the initial setup and configuration of the AVR 435, it is simple to operate and enjoy. The following instructions will help you maximize the enjoyment of your new receiver:

Turning the AVR 435 On or Off

• When using the AVR 435 for the first time, you must press the **Main Power Switch A** to turn the unit on. This places the unit in a Standby mode, as indicated by the amber illumination surrounding the **Standby/On Switch 1**. Once the unit is in Standby, you may begin a listening session by pressing the **Standby/On Switch 1** on the front panel, or the **Power On Button 2** or **AVR Selector 5 B** on the remote. This will turn the unit on and return the AVR to the input source that was last used. The unit may also be turned on from Standby by pressing any of the **Input Selector Buttons 4 34 44 C D** on the remote or the **Input Source Selector Button 7** on the front panel.

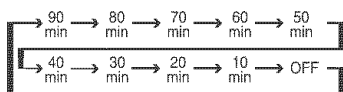
Whenever the AVR is turned on, you will see all of the front-panel indicators light up for a few seconds. This is normal, and it is part of the unit's power-on self test procedure.

NOTE: After pressing one of the **Input Selector Buttons 4 34 44 C D** to turn the unit on, press the **AVR Selector 5 B** to set the remote control to the AVR 435 functions.

To turn the unit off at the end of a listening session, simply press the **Standby/On Switch 1** on the front panel or the **Power Off Button 1 A** on the remote. Power will be shut off to any equipment plugged into the rear-panel **Switched AC Accessory Outlet 11** and the illumination around the **Standby/On Switch 1** will turn amber.

When the remote is used to turn the unit "off," it is actually placing the system in a Standby mode, as indicated by the amber lighting around the **Standby/On Switch 1**.

- To program the AVR 435 for automatic turn-off, press the **Sleep Button 29** on the remote. Each press of the button will decrease the time before shut-down in the following sequence:



Once you have set the desired Sleep Time, the front panel display will automatically dim to half brightness and return. To check on the time remaining until the unit shuts off, press the **Sleep Button 29** once.

To cancel the Sleep function, press and hold the **Sleep Button 29** until the information display returns to normal brightness; and the words **SLEEP OFF** will appear in the **Lower Display Line 14**.

When you will be away from home for an extended period of time, it is always a good idea to completely turn the unit off with the front-panel **Main Power Switch A**.

NOTE: All preset memories are lost if the unit is left turned off by using the **Main Power Switch A** for more than four weeks.

Source Selection

- To select a source, press any of the **Input Selector Buttons 4 34 44 C D** on the remote.
- The input source may also be changed by pressing the front-panel **Input Source Selector Button 7**. Each press of the button will move the input selection through the list of available inputs.
- When a new input is selected, the AVR will automatically switch to the digital input (if selected), surround mode, component video input, A/V Sync Delay and Night Mode configurations that were in effect the last time that input was used. If the **LEVEL TRIM** line on the **CHANNEL ADJUST** menu (Fig. 20) was set to **INDEPENDENT**, as shown on pages 30–31, the settings for channel output levels will also change to the preset values.
- The front-panel **Video 4 Inputs M**, **Optical Digital 3 Input K** or the **Coaxial Digital 3 Input L** may be used to connect a device such as a video game or camcorder to your home entertainment system on a temporary basis.
- As the input source is changed, the new input name will appear momentarily as an on-screen display in the lower third of the video display. The input name will also appear in the **Upper Display Line 13** and in the front-panel **Input Indicators 11**.
- When an audio only source is selected, the last video input used remains routed to the **Video 1/Video 2 Video Outputs 17 19** and **Video Monitor Outputs 14**. This permits simultaneous viewing and listening to different sources.
- When a composite or S-video source is selected, the video signal for that input will be routed to the **Video Monitor Output 14** and will be viewable on a TV monitor connected to the AVR 435.

6-Channel/8-Channel Direct Input

There are two input choices available for use with sources such as a DVD-Audio or SACD player that are connected to the **8-Channel Direct Inputs 40**. Select the appropriate input according to the way your system and source equipment is configured:

- The **6 CH DIRECT** input should be used when the SBR and SBL inputs are NOT in use and the input source device has its own internal bass management system. This input passes the input from the source directly through to the volume control without any analog to digital conversion and it mutes the unused input jacks to prevent unwanted noise from interfering with system performance.

- The **8 CH DIRECT** input should be used when an input is connected to all eight **8-Channel Direct Inputs 40** and when the input source device has its own internal bass management system. This input passes the input from the source directly through to the volume control without any analog to digital conversion and it mutes the unused input jacks to prevent unwanted noise from interfering with system performance.

Volume and Tone Control

- Adjust the volume to a comfortable level using the front-panel **Volume Control 10** or remote **Volume Up/Down Buttons 18 19**.
- To temporarily silence all speaker outputs, press the **Mute Button 33 K**. This will interrupt the output to all speakers and the headphone jack, but it will not affect any recording or dubbing that may be in progress. When the system is muted, the word **MUTE** will flash in the on-screen display and **Upper Display Line 13**, press the **Mute Buttons 33 K** again to return to normal operation.
- The unit's tone controls may be taken out of the signal path by pressing the **Tone Mode Button** on the front panel **C** or the remote **32**. The first press of either button will show a message in the on-screen display and **Lower Display Line 14** with the current status of the tone controls. The system default is **TONE IN**, which indicates that the bass and treble controls are active. Press the **▲/▼ Navigation Button 15** on the remote or the **◀▶ Button H** on the front panel to change the setting to **TONE OUT**, which is "flat" response without the tone controls being active.
- When the tone controls are active, the amount of bass and treble boost/cut may be adjusted by first pressing the **Tone Mode Button** on the front panel **C** or the remote **32** two or three times until the desired setting (**BASS MODE** or **TREBLE MODE**) appears in the on-screen display and the **Lower Display Line 14**. Next, use the **▲/▼ Navigation Button 15** on the remote or the **◀▶ Button** on the front panel **H** to change the setting as desired. The unit will return to normal operation within 5 seconds after the setting is changed.

- For private listening, simply place a standard 1/4" stereo headphone plug or adaptor into the **Headphone Jack 3** behind the door **9** on the front panel. The speakers will automatically mute and a two-channel stereo signal will be sent to the headphones. The **Lower Display Line 14** will read **DOLBY H : BP**, indicating that the headphone output is in the Bypass mode, and to confirm that no processing is being used.
- When the headphones are in use, you may take advantage of the Dolby Headphone modes to bring added spaciousness to headphone listening. Press the **Dolby Mode Select Button 43** or the **Surround Mode Selector 3** to cycle through the three Dolby Headphone modes to select the one that you prefer.

Surround Mode Selection

One of the most important features of the AVR 435 is its ability to reproduce a full multichannel surround sound field from digital sources, analog matrix surround-encoded programs and standard stereo programs.

Selection of a surround mode is based on personal taste, as well as the type of program source material being used. For example, motion pictures or TV programs bearing the logo of one of the major surround-encoding processes, such as Dolby Surround or DTS Stereo may be played in either the Dolby Digital, Dolby Pro Logic II Cinema, DTS Neo:6 Cinema, or Logic 7 Cinema surround modes, depending on the source material.

NOTE: Once a program has been encoded with matrix surround information, it retains the surround information as long as the program is broadcast in stereo. Thus, movies with surround sound may be decoded via any of the analog surround modes such as Pro Logic II Cinema, Logic 7 Cinema or DTS Neo:6 Cinema, when they are broadcast via conventional TV stations, cable, pay-TV and satellite transmission. In addition, a growing number of made-for-television programs, sports broadcasts, radio dramas and music CDs are also produced in surround sound. You may view a list of these programs at the Dolby Laboratories Web site at www.dolby.com.

Even when a program is not listed as carrying intentional surround information, you may find that the Pro Logic II, Pro Logic Ix, Logic 7 or DTS Neo:6, and the Hall or Theater modes often deliver enveloping surround presentations through the use of the natural information present in all stereo recordings.

Surround modes may be changed at any time by using either the front panel or remote control. To

select a new surround mode from the front panel, first press the **Surround Mode Group Selector Button 2** until the desired major surround mode group such as Dolby, DTS or Logic 7 is selected. Next, press the **Surround Mode Selector Button 3** to choose the specific individual surround mode.

To select a surround mode using the remote, press the button for the major surround mode group that includes the mode you wish to choose from: **Dolby 43**, **DTS Digital 42**, **DTS Neo:6 41**, **Logic 7 8**, **Stereo 40** or **DSP Surround 7**. The first press of the button will show the current mode from that group if it is already in use, or the first available mode if you are currently using another mode. To cycle through the available modes in that group, press the button again until the desired mode appears in the **Lower Display Line 14** and the on-screen display and in the front-panel **Surround Mode Indicators 15**.

The Dolby Digital, Dolby Digital EX, DTS 5.1, DTS-ES Matrix and DTS-ES Discrete modes may only be selected when a digital input is in use. In addition, when a digital source is present, the AVR 435 will automatically select and switch to the correct mode, regardless of the mode that has been previously selected. For more information on selecting digital sources, see the Digital Audio Playback section below.

When the 6-Channel/8-Channel direct inputs are in use, there is no surround processing, as these inputs take the analog output signals from an optional, external DVD-Audio or SACD player, or another source device and carry them straight through to the volume control without any further digital processing.

To listen to a program in traditional two-channel stereo, using the front left and front right speakers only (plus the subwoofer, if installed and configured), press the **Stereo Mode Select Button 40** until **SURROUND OFF** appears in the **Lower Display Line 14**. From the front panel, press the **Surround Mode Group Selector 2** until the Stereo modes appear in the on-screen display and **Lower Display Line 14**. Next, press the **Surround Mode Selector Button 3** until **SURROUND OFF** appears in the on-screen display and **Lower Display Line 14**.

Digital Audio Playback

Digital audio is a major advancement over older analog surround processing systems. It delivers up to six discrete channels, and each channel reproduces full frequency range (20Hz to 20kHz) and offers dramatically improved dynamic range and significant improvements to signal-to-noise ratios. In addition, digital systems have the capability to deliver an additional channel that is specifically devoted to low-frequency information. This is the

“.1” channel referred to when you see these systems described as “5.1,” “6.1” or “7.1.” The bass channel is separate from the other channels, but since it is intentionally bandwidth-limited, sound designers have given it that unique designation. When a Digital soundtrack is playing, the number of channels available will vary according to the way in which the program was recorded. Although most movies recorded with digital sound have 5.1 soundtracks, some have 6.1 or 7.1 sound, while others retain the original 2.0 or even monaural sound. When the program source is a broadcast, cable or satellite delivered digital program, only one type of soundtrack may be delivered at a time, while optical sources such as DVD may provide more than one audio option. In either case, the decision of what type of sound track and how many channels to offer is up to the program’s producer. With the AVR 435 you are able to not only play back the original compatible digital format, but using the processing power of the Texas Instruments DSP processor it is possible to decode the basic digital track for 2.0 or 5.1 sound and then select an additional “post-processing” mode to deliver additional channels.

Dolby Digital

Dolby Digital is a standard part of DVD, and is available on specially encoded LD discs and satellite broadcasts and it is a part of the high-definition television (HDTV) system.

An optional, external RF demodulator is required to use the AVR 435 to listen to the Dolby Digital soundtracks available on laser discs. Connect the RF output of the LD player to the demodulator and then connect the digital output of the demodulator to the **Optical or Coaxial Inputs KM 39 36** of the AVR 435. No demodulator is required for use with DVD players or DTS-encoded laser discs.

In order to provide maximum playback compatibility with DVDs, the AVR 435 receiver will always default first to the playback mode embedded in a disc’s digital “flag” information. For Dolby Digital discs, the following playback modes are initially selected after the AVR locks to the incoming digital audio data stream to identify the selected:

- When a 5.1 audio stream is detected, the Dolby Digital 5.1 format will be selected, regardless of the number of speakers in your system, in compliance with Dolby Laboratories licensing requirements.
- When a disc with the Dolby Digital EX format flag is played, your system will automatically switch to the EX mode when seven main channel speakers are available.

OPERATION

Surround Mode Chart

MODE	FEATURES
Dolby Digital	Available only with digital input sources encoded with Dolby Digital data. It provides up to five separate main audio channels and a special dedicated low-frequency effects channel.
Dolby Digital EX	Available when the receiver is configured for 6.1/7.1 channel operation, Dolby Digital EX is the latest version of Dolby Digital. When used with movies or other programs that have special encoding, Dolby Digital EX reproduces specially encoded soundtracks so that a full 6.1/7.1 sound field is available. Even if a source does not contain specific EX encoding, the special algorithms may be used to derive a 6.1/7.1 output.
DTS 5.1	When the speaker configuration is set for 5.1-channel operation, the DTS 5.1 mode is available when DVD, audio-only music or laser discs encoded with DTS data are played. DTS 5.1 provides up to five separate main audio channels and a special dedicated low-frequency channel.
DTS-ES 6.1 Matrix DTS-ES 6.1 Discrete	When the speaker configuration is set for 6.1/7.1 operation, playback of a DTS-encoded program source will automatically trigger the selection of one of the two DTS-ES modes. Newer discs with special DTS-ES discrete encoding will be decoded to provide six discrete, full-bandwidth channels plus a separate low-frequency channel. All other DTS discs will be decoded using the DTS-ES Matrix mode, which creates a 6.1-channel sound field from the original 5.1-channel soundtrack.
Dolby Pro Logic II Movie Music Game Pro Logic	Dolby Pro Logic II decodes full-range, discrete, left, center right, right surround and left surround channels from either matrix surround-encoded programs and conventional stereo sources when an analog input is in use. The Dolby Pro Logic II Movie mode is optimized for movie soundtracks, while the Pro Logic II Music mode should be used with musical selections. The Pro Logic II Game mode is designed to enhance the soundtrack of video games from either dedicated consoles or computers. The Pro Logic mode re-creates original Pro Logic processing for those who prefer that presentation.
Dolby Pro Logic IIx Movie Music Game	Dolby Pro Logic IIx is the latest extension of Dolby Laboratory's benchmark surround technology that creates a discrete 7.1 sound field from matrix surround or two-channel stereo sources when your system is configured for surround back speakers. Movie, Music and Game versions are available that customize the processing to the type of source in use. These modes may also be used to add surround back channels to 5.1 digital soundtracks.
Logic 7 Cinema Logic 7 Music Logic 7 Enhance	Exclusive to Harman Kardon for A/V receivers, Logic 7 is an advanced mode that extracts the maximum surround information from either surround-encoded programs or conventional stereo material. When your system has been configured for use with Surround Back speakers (see page 41), you may choose between either 7.1 or 5.1 versions of the Logic 7 modes, while only the 5.1 versions are available when there are no Surround Back Speakers. The Logic 7 C (or Cinema) mode should be used with any source that contains Dolby Surround or similar matrix encoding. Logic 7 C delivers for increased center channel intelligibility, and more accurate placement of sounds with fades and pans. The Logic 7 M, or music mode, enhances the listening experience by presenting a wider front soundstage and greater rear ambience. Both Logic 7 modes also direct low-frequency information to the subwoofer (if installed and configured) to deliver maximum bass impact. Logic 7 adds additional bass enhancement that circulates low frequencies in the 40Hz to 120Hz range to the front and surround speakers to deliver a less localized soundstage that appears broader and wider than when the subwoofer is the sole source of bass energy. Logic 7/7 may also be used to add surround back channels to many 5.1 digital soundtracks.
DTS Neo:6 Cinema DTS Neo:6 Music	These two modes are available when any analog source is playing to create a three-channel, five-channel or six-channel surround presentation from conventional Matrix-encoded and traditional Stereo sources. Select the Cinema version of Neo:6 when a program with any type of analog Matrix surround encoding is present. Select the Music version of Neo:6 for optimal processing when a non-encoded, two-channel stereo program is being played.
Theater	The Theater mode creates a sound field that resembles the acoustic feeling of a standard live performance theater.
Hall 1, Hall 2	The two Hall modes create sound fields that resemble a small- (Hall 1) or medium-sized (Hall 2) concert hall.
Dolby Virtual Speaker Reference Wide	Dolby Virtual Speaker technology uses a next-generation advanced algorithm to reproduce the dynamics and surround sound effects of a precisely placed 5.1-channel speaker system using only front left and right speakers. In the Reference mode, the apparent width of the sound across the front image is defined by the distance between the two speakers. The Wide mode provides a wider, more spacious front image when the two speakers are close together. Depending on the number of speakers available in your system, a variety of different sound field options are available for both the Reference and Wide modes.
5-Channel Stereo 7-Channel Stereo	This mode takes advantage of multiple speakers to place a stereo signal at both the front and back of a room. Depending on whether the AVR has been configured for either 5.1 or 6.1/7.1 operation, one of these modes, but not both, is available at any time. Ideal for playing music in situations such as a party, it places the same signal at the front-left and surround-left, and front-right and surround-right speakers. The center channel is fed a summed mono mix of the in-phase material of the left and right channels.
Surround Off (Stereo)	This mode turns off all surround processing and presents the pure left- and right-channel presentation of two-channel stereo programs.
Dolby Headphone DH1 DH2 DH3	Dolby Headphone enables ordinary stereo headphones to portray the sound of a five-speaker surround-playback system. The DH1 mode creates headphone presentation that resembles a small, well-damped room and is appropriate for use with both movies and music-only recordings. The DH2 mode creates a more acoustically live room particularly suited to music listening. The DH3 mode creates a larger room, more like a concert hall or movie theater.

- When a disc with Dolby Digital data, but only 2.0 audio is detected, the default mode is Dolby Digital with Pro Logic II post-processing when you have a 5.1 speaker system, or Dolby Digital with Pro Logic IIx post-processing when you have a 7.1 speaker system.
- Depending on the number of speaker channels available in your system, once the AVR locks to the digital signal, you may select any surround mode or post-processing option that is available, based on the incoming data stream's possible restrictions and the number of speakers in your system. For example, when a 5.1 or 2.0 audio stream is in use, you may select alternate post-processing such as Logic 7/7-Channel Movie Mode post-processing to create the rear surrounds in 7.1 speaker systems.

DTS

DTS is another digital audio system that is capable of delivering 5.1 or 6.1 discrete or matrix sound field reproduction. Although both DTS and Dolby Digital are digital, they use different methods of encoding the signals, and thus they require different decoding circuits to convert the digital signals back to analog.

DTS-encoded soundtracks are available on select DVD and LD discs, as well as on special audio-only DTS discs. You may use any LD or CD player equipped with a digital output to play DTS-encoded discs with the AVR 435. All that is required is to connect the player's output to either an **Optical** or **Coaxial Input** on the rear panel **43 45** or front panel **K M**.

In order to listen to DVDs encoded with DTS soundtracks, the DVD player must be compatible with the DTS signal, which is indicated by a DTS logo on the player's front panel. Early DVD players may not be able to play DTS-encoded DVDs. This does not indicate a problem with the AVR 435, as some players cannot pass the DTS signal through to the digital outputs. If you are in doubt as to the capability of your DVD player to handle DTS discs, consult the player's owner's manual.

NOTE: Some DVD players have a default setting that does not pass through the DTS signal. Before playing DVDs with a DTS soundtrack, make certain that the settings in your DVD player have been properly adjusted so that DTS audio is passed through. Consult the owner's manual for your DVD player for more information on making these settings.

Selecting a Digital Source

To utilize either digital mode, you must have properly connected a digital source to the AVR 435. Connect the digital outputs from DVD players, HDTV receivers, satellite systems or CD players to the **Optical** or

Coaxial Inputs **K M 43 45**. In order to provide a backup signal and a source for analog stereo recording, the analog outputs provided on digital source equipment should also be connected to their appropriate inputs on the AVR 435 rear panel (e.g., connect the analog stereo audio output from a DVD to the **DVD Audio Inputs 42** on the rear panel when you connect the source's digital outputs).

If you have not already configured an input for a digital source using the on-screen menus as shown on page 21, first select the input using the remote or front panel controls, as outlined in this manual. Next, select the digital source by pressing the **Digital Select Button 16 F** and then using the **▲/▼ Navigation Button 15** on the remote or the **◀/▶ Button H** on the front panel to choose any of the **OPTICAL** or **COAXIAL** inputs, as they appear in the **Upper Display Line 13** or on-screen display. When the digital source is playing, the AVR 435 will automatically detect which type of digital data stream is being decoded and display that information in the **Upper Display Line 13**.

When both a digital and an analog connection are made between a source device and the AVR, the digital input is the default. If the digital stream is not present or is interrupted, the unit will automatically switch over to the analog inputs for the selected source.

If you wish to disable the auto-polling feature, you may do so by following the instructions shown in the Advanced Features section of this manual on page 40.

Digital Bitstream and Surround Mode Indications

When a digital source is playing, the AVR 435 senses the type of bitstream data that is present. Using this information, the correct surround mode will automatically be selected. For example, DTS bitstreams will cause the unit to switch to DTS decoding, and Dolby Digital bitstreams will enable Dolby Digital decoding. When the unit senses PCM data from CDs or LDs, you may select any of the standard Dolby or DTS surround modes or Logic 7. Since the range of available surround modes is dependent on the type of digital data that is present, the AVR 435 shows you what type of signal is present to help you understand the choice of modes.

When a digital source is first detected, the AVR 435 will display a message to indicate the type of bitstream being received. This message will appear shortly after an input or surround mode is changed, and will remain in the **Lower Display Line 14** for about five seconds before that portion of the display returns to the normal surround mode indication.

For Dolby Digital and DTS sources, a numerical indication (such as 3/2/2.1) will appear, showing the number of channels present in the data.

The first number in the display message indicates how many discrete front-channel signals are present.

- A "3" tells you that separate front left, center and front right signals are available. This will be displayed for Dolby Digital 5.1 and DTS 5.1 programs.
- A "2" tells you that separate front left and right signals are available, but there is no discrete center channel signal. This will be displayed for Dolby Digital bitstreams that have stereo program material.
- A "1" tells you that there is only a mono channel available in the Dolby Digital bitstream.

The middle number in the display message indicates how many discrete surround channel signals are present.

- A "3" tells you that separate, discrete left surround, center surround and right surround signals are present. This is available only on discs with DTS-ES digital audio.
- A "2" tells you that separate surround left and right signals are available. This will be displayed for Dolby Digital 5.1 and DTS 5.1 programs.
- A "1" tells you that there is only a single, surround-encoded surround channel. This will appear for Dolby Digital bitstreams that have matrix encoding.
- A "0" indicates that there is no surround channel information. This will be displayed for two-channel stereo programs.

The last number indicates whether there is a discrete low-frequency effects (LFE) channel. This is the ".1" in the common abbreviation of "5.1" sound and it is a special channel that contains only bass frequencies.

- A ".1" tells you that an LFE channel is present. This will be displayed for Dolby Digital 5.1 and DTS 5.1 programs, as available.
- A "0" indicates that there is no LFE channel information available. However, even when there is no dedicated LFE channel, low-frequency sound will be present at the subwoofer output when the speaker configuration is set to show the presence of a subwoofer.
- The information in the right side of the display will tell you if the digital audio data contains a special flag signal that will automatically activate the appropriate 6.1 or 7.1 mode. This will be shown as EX-ON or EX-OFF for Dolby Digital bitstreams and ES-ON or ES-OFF for DTS bitstreams.

When a 2.0 or 5.1 digital source is playing on a system configured for 5.1 operation, you may use Dolby Digital EX, DTS-ES, Logic 7/7 or Dolby Pro Logic IIx to add rear channels for full 7.1 sound fields. Note, however, that the availability of specific modes for post-processing is dependant on the format of the incoming source material. While some combinations

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(e.g., a Dolby Digital or DTS 5.1 source with Logic 7/7 or Dolby Pro Logic IIx post-processing) are allowable, others (e.g. A Dolby Digital 5.1 source with DTS Neo:6) are not. If you wish to add surround back channels to a 2.0 or 5.1 source we recommend that you experiment with the various options to see which may be available and which are best suited to your taste and listening environment.

It is always a good idea to check the readout for the channel data to make certain that it matches the audio logo information shown on the back of a DVD package. In some cases, you will see an indication for "2/0/0" even when the disc contains a full 5.1, or 3/2/1, signal. When this happens, check the audio output settings for your DVD player or the audio menu selections for the specific disc being played to make certain that the player is sending the correct signal to the AVR.

PCM Playback

PCM is the abbreviation for Pulse Code Modulation, the digital signal format used for standard CD playback, and other non-Dolby Digital and non-DTS digital sources such as Mini-Disc. When a PCM signal is detected, the **Lower Display Line 14** will briefly show a message with the letters PCM, in addition to a readout of the sampling frequency of the digital signal.

In most cases, this will be **PCM 44.1kHz** or **PCM 48kHz**, though in the case of specially mastered, high-resolution audio discs, you will see a **PCM 96kHz** indication. Note that the sampling rate displayed is that of the incoming digital signal, and not the upsampled rate that may be applied to PCM sources when Dolby Pro Logic or Pro Logic II processing is applied, as shown on page 21.

During PCM playback, you may select any surround mode except one of the Dolby Digital or DTS/DTS-ES modes.

Speaker/Channel Indicators

In addition to the bitstream indicators, the AVR 435 features a set of unique channel-input indicators that tell you how many channels of digital information are being received and/or whether the digital signal is interrupted (Figure 21).

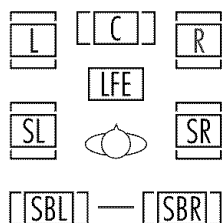


Figure 21

The letters inside the boxes tell you which channels are receiving an input signal. Since conventional analog audio is only two channels, the "L" and "R" letters will light with any analog source. When a digital source is in use you will see letters displayed that correspond to the number of channels in the incoming data stream, which may be just the L and R for two channel PCM or 2.0 Dolby Digital material. When a 5.1 signal is being received the L/C/R/SL/SR indicators will light, with the LFE indication also being shown when an LFE signal is present. All seven indicators, including the SBL/SBR letters will light for a 7.1 signal, and a horizontal line is shown to connect the SBL/SBR indicators when a 6.1 source is in use.

It is important to note that although Dolby Digital, for example, is referred to as a "5.1" system, not all Dolby Digital DVDs or programs are encoded for 5.1. Thus, it is sometimes normal for a DVD with a Dolby Digital soundtrack to trigger only the "L" and "R" indicators.

NOTE: Many DVD discs are recorded with both "5.1" and "2.0" versions of the same soundtrack. When playing a DVD, always be certain to check the type of material on the disc. Most discs show this information in the form of a listing or icon on the back of the disc jacket. When a disc does offer multiple soundtrack choices, you may have to make some adjustments to your DVD player (usually with the "Audio Select" button or in a menu screen on the disc) to send a full 5.1 feed to the AVR 435. It is also possible for the type of signal feed to change during the course of a DVD's playback. In some cases, the previews of special material will only be recorded in 2.0 audio, while the main feature is available in 5.1 audio. The AVR 435 will automatically sense changes to the bitstream and channel count and reflect them in these indicators.

The letters used by the **Speaker/Channel Input Indicators 12** will flash to indicate when a bitstream has been interrupted. This will happen when a digital input source is selected before the playback starts, or when a digital source such as a DVD is paused. The flashing indicators remind you that the playback has stopped due to the absence of a digital signal and not through any fault of the AVR 435. This is normal, and the digital playback will resume once the playback is started again.

The boxes around the channel indication letters are used to show which speakers are configured in your system. A small box around the letter indicates that a "Small" speaker has been assigned to that position, while a larger, double box indicates a "Large" speaker assignment.

Note that in some cases, such as an analog stereo or 2.0 digital source you will see empty speaker position boxes, which indicates that the speaker is active and will receive sound, but that there is no discrete signal

for that channel. In other cases you may see letters with no speaker boxes. This indicates that there is a discrete signal for that channel, but due to the mode in use (e.g. Dolby VS with a 5.1 source) there is no signal being sent to the channel.

Night Mode

A special feature of Dolby Digital is the Night mode, which enables specially encoded Dolby Digital input sources to be played back with full digital intelligibility while reducing the minimum peak level by 1/4 to 1/3. This prevents abruptly loud transitions from disturbing others, without reducing the impact of the digital source. The Night mode is available only when Dolby Digital signals with special data are being played.

The Night mode may be engaged when a Dolby Digital DVD is playing by pressing the **Night Mode Button 30** on the remote. Next, press the **▲/▼ Navigation Button 15** to select either the middle range or full compression versions of the Night mode. To turn the Night mode off, press the **▲/▼ Navigation Button 15** until the message in the lower third of the video display and in the **Lower Display Line 14** reads **D - RANGE OFF**.

The Night mode may also be selected to always be on at either level of compression using the options in the **DOLBY SURROUND** menu. See page 23 for information on using the menus to set this option.

MP3 Audio Playback

The AVR 435 is one of the few receivers equipped for onboard decoding for the MP3 audio format used by computers and portable audio devices. By offering MP3 decoding, the AVR 435 is able to deliver precise conversion of the digital signals to an analog output, along with the benefits of listening to the MP3 audio through the AVR 435's high-current amplifier and the speakers from your surround system, rather than the smaller speakers and low-powered amplifiers typically used with computers.

To take advantage of the AVR 435's MP3 capabilities, simply connect the S/P-DIF output of a computer's sound card or the S/P-DIF output of a portable digital audio device to either the rear panel **Digital Inputs 33 36** or the front-panel **Digital Inputs K M**.

When the digital signal is available, the **Lower Display Line 14** will indicate that an MP3 bitstream is present, and the audio will begin playing.

NOTES:

- The AVR 435 is only capable of playing signals in the MP3 (MPEG 1/Layer 3) format. It is not compatible with other computer audio codecs.
- The digital audio input signal may be either optical or coaxial, but the signal must be in the S/P-DIF

format. Direct connection of USB or serial data outputs is not possible, even though the signals are in the MP3 format. If you have any questions about the data output format from your computer or a sound card, check with the device's owner's manual or contact the manufacturer's technical support area.

- If your computer or sound card's digital output is not capable of direct connection to the AVR 435, you may use an optional, external transcoder to convert the USB output of a computer to a format compatible with the AVR.
- Due to the wide variation in MP3 formats and encoding speeds, it is possible that the AVR 435 may not be compatible with all MP3 input signals. Some may produce unacceptable results and some may not be decoded. This is not a fault of either the computer or the AVR 435, but rather a by-product of the unpredictable nature of MP3 playback.

IMPORTANT NOTES ON DIGITAL PLAYBACK:

- When playing DVDs, please note that even when you have selected a specific digital audio format for playback, an individual disc may change formats or the number of available channels during playback. For example, even if you select a DTS mode for the movie, you may see Dolby Digital in use when the trailers, menus or copyright warnings are playing. This is not a fault with either the AVR or your DVD player, as both are responding to the way the disc was created.
- When viewing digital television signals, note that the number of audio channels available may vary during the course of a program, depending on the content. For example, while a sports event may have 5.1 sound, the commercials or local station content may be in 2.0. In addition, not all local stations are currently equipped for carrying the 5.1 digital audio signals. This may mean that even though the actual program is produced with 5.1, it may be transmitted in a 2.0 configuration in some areas. Your AVR will automatically change to react to the proper type of audio stream if it is changed by the broadcast station.
- Although the AVR 435 will decode virtually all current DVD movies, CDs and HDTV sources, it is possible that some future digital sources may not be compatible with the AVR 435.
- Not all digitally encoded programs contain full 5.1- or 6.1-channel audio. Consult the program guide that accompanies the DVD or laser disc to determine which type of audio has been recorded on the disc. The AVR 435 will automatically sense the type of digital surround encoding used and adjust to accommodate it.

- When a digital source is playing, you may not be able to select some of the analog surround modes such as Dolby Pro Logic II, Dolby Pro Logic IIx, Stereo, Hall, Theater or Logic 7.
- When a Dolby Digital or DTS source is playing, it is not possible to make an analog recording using the **Tape Outputs** **35** and **Video 1 or Video 2 Audio Outputs** **38** **41**. However, the digital signals will be passed through to the **Digital Audio Outputs** **28** **30** **M**.

Tuner Operation

The AVR 435's tuner is capable of tuning AM, FM and FM Stereo broadcast stations. Stations may be tuned manually, or they may be stored as favorite station presets and recalled from a 30-position memory.

Station Selection

1. Press the **AM/FM Tuner Selector Button** **34** on the remote to select the tuner as an input. The tuner may be selected from the front panel by either pressing the **Input Source Selector** **7** until the tuner is active or by pressing the **Tuner Band Selector** **5**.
2. Press the **AM/FM Tuner Select Button** **34** or **Tuner Band Selector** **5** again to switch between AM and FM so that the desired frequency band is selected.
3. Press the **Tuning Mode Selector** **8** **12** to select manual or automatic tuning.

When the button is pressed so that **AUTO / STEREO** appears in the **Upper Display Line** **13**, each press of the **Tuning Selectors** **4** **23** will put the tuner in a scan mode that seeks the next higher or lower frequency station with acceptable signal strength. An **AUTO ST TUNED** indication will momentarily appear when the station stops at a stereo FM station, and an **AUTO TUNED** indication will momentarily appear when an AM or monaural FM station is tuned. Press the Tuning buttons again to scan to the next receivable station.

When the button is pressed so that **MANUAL / MONO** appears in the **Upper Display Line** **13**, each tap of the Selector will increase or decrease the frequency by one increment. When the tuner receives a strong enough signal for adequate reception, **MANUAL TUNED** will appear in the **Lower Display Line** **14**.

4. Stations may also be tuned directly in either the automatic or manual mode. To enter a station's frequency directly, first select the AM or FM band as desired by pressing the **AM/FM Tuner Select**

Button **5** **34**. Next, press the **Direct Button** **9**. Within 5 seconds of when **DIRECT IN** scrolls in the **Upper Display Line** **13**, enter the station frequency by pressing the **Numeric Keys** **11**. If you press an incorrect button while entering a direct frequency, press the **Clear Button** **10** to start over.

NOTE: When the FM reception of a station is weak, audio quality will be increased by switching to Mono mode by pressing the **Tuning Mode Button** **8** **12** so that **MANUAL / MONO** appears momentarily in the **Upper Display Line** **13** and then goes out. This will also activate manual tuning mode.

Preset Tuning

Using the remote, up to 30 stations may be stored in the AVR 435's memory for easy recall using the front-panel controls or the remote.

To enter a station into the memory, first tune the station using the steps outlined above. Then:

1. Press the **Memory Button** **39** on the remote; the station's frequency will flash.
2. Within five seconds, press the **Numeric Keys** **11** corresponding to the location where you wish to store this station's frequency. Once entered, the preset number will appear in the **Upper Display Line** **13**.
3. Repeat the process after tuning any additional stations to be preset.

Recalling Preset Stations

- To manually select a station previously entered in the preset memory, press the **Numeric Keys** **11** that correspond to the desired station's memory location.
- To manually tune through the list of stored preset stations one by one, press the **Preset Stations Selector Buttons** **6** **22** on the front panel or remote.

Recording

In normal operation, the audio or video source selected for listening through the AVR 435 is sent to the record outputs. This means that any program you are watching or listening to may be recorded simply by placing machines connected to the outputs for **Tape Outputs** **35** or **Video 1/Video 2 Audio and Video Outputs** **17** **19** **38** **41** in the record mode.

When a digital audio recorder is connected to the **Digital Audio Outputs** **28** **30**, you are able to record the digital signal using a CD-R, MiniDisc or other digital recording system.

OPERATION

NOTES:

- The digital outputs are active only when a digital signal is present, and they do not convert an analog input to a digital signal, or change the format of the digital signal. In addition, the digital recorder must be compatible with the output signal. For example, the PCM digital input from a CD player may be recorded on a CD-R or MiniDisc, but Dolby Digital or DTS signals may not.
- Please make certain that you are aware of any copyright restrictions on any material you copy. Unauthorized duplication of copyrighted materials is prohibited by federal law.

Output Level Trim Adjustment

Normal output level adjustment for the AVR 435 is established using EzSet/EQ, as outlined on pages 23–26. In some cases, however, it may be desirable to adjust the output levels using program material such as a test disc, or a selection you are familiar with. Additionally, the output level for the subwoofer can only be adjusted using this procedure.

To adjust the output levels using program material, first set the reference volume for the front left and front right channels using the **Volume Control** **10** **18** **1**.

Once the reference level has been set, press the **Channel Select Button** **14** and **FRONT LEVEL** will appear in the **Lower Display Line** **14**. To change the level, first press the **Set Button** **17**, and then use the **▲/▼ Navigation Button** **15** to raise or lower the level. DO NOT use the volume control, as this will alter the reference setting.

Once the change has been made, press the **Set Button** **17** and then press the **▲/▼ Navigation Button** **15** to select the next output-channel location that you wish to adjust. To adjust the subwoofer level, press the **▲/▼ Navigation Button** **15** until **W O O F E R LEVEL** appears in the **Lower Display Line** **14** or on-screen display.

Repeat the procedure as needed until all channels requiring adjustment have been set. When all adjustments have been made and no further adjustments are made for 5 seconds, the AVR 435 will return to normal operation.

The output levels may also be adjusted using the on-screen menu system to either the internal test tone or an external test disc by following the instructions shown on page 29.

Dim Function

Since the AVR 435 will often be used when movies or other video programming is viewed under low-light conditions, you may wish to lower the brightness of the front-panel displays and indicators so that they do not distract from the video presentation. You may dim the displays using the menu system, as shown on page 39, or you may control the brightness directly from the remote.

Simply press the **Dim Button** **13** once to dim the front panel to half the normal brightness level; press it again to turn the displays off. Note that when the displays are dimmed or turned off, the blue lighting around the **Standby/On Switch** **1** will continue to stay lit as a reminder that the AVR is still turned on. The accent lighting for the **Volume Control** **10** will remain at its normal level, rather than dim when the panel displays are at half brightness.

Note that all changes to the front-panel brightness level are temporary; the displays will return to full brightness after the AVR is turned off and then on again. To return the displays to full brightness without turning the unit off, press the **Dim Button** **13** as needed until the displays are on.

In addition to lowering the brightness of the displays or turning them off completely, you may wish to have them appear whenever a button on the remote or front panel is pushed, and then gradually fade out after a set time period. You may do this by making the appropriate settings in the **VFD FADE TIME OUT** line of the **ADVANCED SELECT** Menu, as shown on page 39.

Memory Backup

This product is equipped with a memory backup system that preserves the system configuration information and tuner presets if the unit is accidentally unplugged or subjected to a power outage. This memory will last for at least four weeks, after which time all information must be reentered.

The AVR 435 is equipped with a number of advanced features that add extra flexibility to the unit's operation. While it is not necessary to use these features to operate the unit, they provide additional options that you may wish to use.

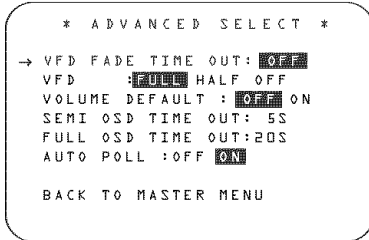


Figure 22

Front-Panel-Display Fade

In normal operation, the front-panel displays and indicators remain on at full brightness, although you may also dim them or turn them off as shown on page 35. As an additional option, you may also set the AVR so that the displays are on whenever a button is pressed on the front panel or remote, but then fade out after a set period of time.

To set the front-panel displays to the Fade mode, press the **OSD Button 31** to bring the Master Menu to the screen. Press the **▲/▼ Navigation Button 15** so that the **→** cursor is pointed to the **ADVANCED** line, and press the **Set Button 17** to enter the **ADVANCED SELECT** menu (Figure 22).

With the **ADVANCED SELECT** menu on your video display, press the **▲/▼ Navigation Button 15** so that the **→** cursor is pointed to the **VFD FADE TIME OUT** line. Next, press the **◀/▶ Navigation Button 15** so that the amount of time that you wish the displays to fade out after a button is pressed is shown. When **OFF** is selected there is no display fade-out.

Once this time is set and the unit returned to normal operation, the displays will remain on for the time period selected whenever a button is pressed on the front panel or remote. After that time they will gradually fade out, with the exception of the lighting surrounding the **Standby/On Switch 1**, which remains on to remind you that the AVR is turned on. Note that if the displays have been turned completely off using the Dim Button, as shown on page 38, the Fade function will not operate.

If you wish to make adjustments to other items on the **ADVANCED SELECT** menu, press the **▲/▼ Navigation Button 15** so that the **→** cursor is next to the desired item, or place the **→** cursor next to the **BACK TO MASTER MENU** line and press the **Set Button 17** to make an adjustment to

another menu. If you have completed all adjustments, press the **OSD Button 31** to exit the menu system.

Display Brightness

The AVR 435's front-panel displays and indicators are set at a default brightness level that is sufficient for viewing in a normally lit room. However, you may wish to occasionally lower the brightness of the display, or turn it off completely.

To change the display brightness setting for a specific listening session, you will need to make an adjustment in the **ADVANCED SELECT** menu. To start, press the **OSD Button 31** to bring the **MASTER MENU** to the screen. Press the **▼ Navigation Button 15**, until the cursor is next to the **ADVANCED** line. Press the **Set Button 17** to enter the **ADVANCED SELECT** menu (Figure 22).

Next, press **◀/▶ Navigation Button 15** until the cursor is next to the **VFD** line. Press the **▶ Navigation Button 15** until the desired brightness level is highlighted in the video display. When **FULL** is highlighted, the display is at its normal brightness. When **HALF** is highlighted, the display is at half the normal brightness level. When **OFF** is highlighted, all of the front-panel indicators will go dark. However, the blue lighting surrounding the **Standby/On Switch 1** will remain lit to remind you that the AVR is still turned on.

Once the desired brightness level is selected, it will remain in effect until it is changed again or until the unit is turned off.

If you wish to make other adjustments, press the **▲/▼ Navigation Button 15** until the **→** cursor is next to the desired setting or the **BACK TO MASTER MENU** line and press the **Set Button 17**. If you have no other adjustments to make, press the **OSD Button 31** to exit the menu system.

Turn-On Volume Level

As is the case with most audio/video receivers, when the AVR 435 is turned on, it will always return to the volume setting in effect when the unit was turned off. However, you may prefer to always have the AVR 435 turn on at a specific setting, regardless of what was last in use when the unit was turned off. To change the default condition so that the same volume level is always used at turn-on, you will need to make an adjustment in the **ADVANCED SELECT** menu. To start, press the **OSD Button 31** to bring the **MASTER MENU** (Figure 1) to the screen. Press the **▼ Navigation Button 15**, until the cursor is next to the **ADVANCED** line. Press the **Set Button 17** to enter the **ADVANCED SELECT** menu (Figure 22).

Next, make certain that the cursor is next to the **VOLUME DEFAULT** line by pressing the **▲/▼ Navigation Button 15** as needed. Press the **▶ Navigation Button 15** so that the word **ON** is highlighted. To set the actual turn-on level, press the **▼ Navigation Button 15** once so that the cursor is next to the **DEFAULT VOL SET** line. Press the **◀/▶ Navigation Button 15** until the desired volume level is shown on the **DEFAULT VOL SET** line. This setting may NOT be made with the regular volume controls.

NOTE: Since the setting for the turn-on volume cannot be heard while the setting is being made, you may wish to determine the setting before making the adjustment. To do this, listen to any source and adjust the volume to the desired level using the regular **Volume Controls 10 18 1**. When the desired volume level to be used at turn-on is reached, make a note of the setting as it appears in the lower third of the video screen or in the **Lower Display Line 14**. (A typical volume level will appear as a negative number such as **-25dB**.) When making the adjustment, use the **◀/▶ Navigation Button 15** to enter this setting.

Unlike some of the other adjustments in this menu, the turn-on volume default will remain in effect until it is changed or turned off in this menu, even when the unit is turned off.

If you wish to make other adjustments, press the **▲/▼ Navigation Button 15** until the on-screen **→** cursor is next to the desired setting or the **BACK TO MASTER MENU** line, and press the **Set Button 17**. If you have no other adjustments to make, press the **OSD Button 31** to exit the menu system.

Semi-OSD Settings

The semi-OSD system places one-line messages at the lower third of the video display screen whenever the Volume, Input Source, Surround mode, tuner frequency or any of the configuration settings is changed. The semi-OSD system is helpful in that it enables you to have feedback on any control changes or remote commands using the video display when it is difficult to view the front-panel displays. However, you may also prefer to turn these displays off permanently. You may also want to adjust the length of time the displays remain on the screen. Both of those options are possible with the AVR 435.

To adjust the on-screen appearance of the semi-OSD system, press the **OSD Button 31** to bring the **MASTER MENU** to the screen. Press the **▼ Navigation Button 15**, until the on-screen **→** cursor is next to the **ADVANCED** line.

ADVANCED FEATURES

Press the **Set Button** **17** to enter the **ADVANCED SELECT** menu.

When the **ADVANCED SELECT** menu appears, press the **▲/▼ Navigation Button** **15** so that the cursor is pointing to the **SEMI OSD / TIME OUT** line. Select one of these options:

- To keep the semi-OSD system activated, but to adjust the length of time the displays remain on the screen, press the **◀/▶ Navigation Button** **15** until the desired time-out is shown. The default setting is 5 seconds.
- To turn the semi-OSD system off so that it does not appear at any time, press the **◀/▶ Navigation Button** **15** so that **OFF** is shown on the right side of the line.

If you wish to make other adjustments, press the **▲/▼ Navigation Button** **15** until the cursor is next to the desired setting or the **BACK TO MASTER MENU** line and press the **Set Button** **17**. If you have no other adjustments to make, press the **OSD Button** **31** to exit the menu system.

Full-OSD Time-Out Adjustment

The **FULL OSD** menu system is used to simplify the setup and adjustment of the AVR 435 by using a series of on-screen menus. The factory default setting for these menus leaves them on the screen for 20 seconds after a period of inactivity before they disappear from the screen (Time-Out). Time-Out is a safety measure to prevent image retention of the menu text in your monitor or projector, which might happen if it were left on indefinitely. However, some viewers may prefer a slightly longer or shorter period before the on-screen display disappears.

To change the full-OSD Time-Out, you will need to make an adjustment in the **ADVANCED SELECT** menu (Figure 17). To start the adjustment, press the **OSD Button** **31** to bring the **MASTER MENU** to the screen. Press the **▼ Navigation Button** **15**, until the on-screen → cursor is next to the **ADVANCED** line. Press the **Set Button** **17** to enter the **ADVANCED SELECT** menu (Figure 22).

At the **ADVANCED SELECT** menu (Fig. 22) make certain that the cursor is next to the **FULL OSD TIME OUT** line by pressing the **▲/▼ Navigation Button** **15** as needed. Next, press the **◀/▶ Navigation Button** **15** until the desired time is displayed in seconds. Unlike most of the other options in this menu, this is a permanent setting change, and

the Time-Out entry will remain in effect until it is changed, even if the unit is turned off.

If you wish to make other adjustments, press the **▲/▼ Navigation Button** **15** until the cursor is next to the desired setting or the **BACK TO MASTER MENU** line and press the **Set Button** **17**. If you have no other adjustments to make, press the **OSD Button** **31** to exit the menu system.

Digital Auto-Poll Settings

In order to provide the greatest flexibility in accommodating the widest range of sources, the AVR 435 includes both analog and digital audio inputs for all sources. In most cases you will want to use one or the other, but not both. However, in some circumstances it is desirable to make both an analog and digital connection between a source device and the AVR.

An important application for dual audio connections is with cable or satellite boxes, where the audio output may change depending on the channel being viewed and the type of audio the cable system or satellite receiver associates with it. To eliminate the need to constantly switch back and forth to select an audio type each time you change channels, the AVR 435 is programmed by default to automatically “poll” the audio inputs. When a digital audio stream is selected first, but if the digital audio is removed the AVR will switch to the analog inputs associated with that input as a back-up. In most systems this is the correct operation and no further change is required.

However, if this configuration does not suit your system application the AVR 435 gives you the flexibility to turn the digital audio auto polling on or off on an input-by-input basis. When the Auto Polling is set to **OFF**, the system will keep the digital audio input active and not attempt to switch to the analog source even when the digital data stream stops.

If you wish to change the auto poll setting, first select the input you wish to configure by pressing the appropriate **Input Selector** **4D** on the remote, or on the **SOURCE** line of the **IN/OUT SETUP** menu (Figure 2). Next, with the **ADVANCED SELECT MENU** (Figure 22) on the screen, press the **◀/▶ Navigation Button** **15** so that the cursor is pointing to the **AUTO POLL** line. Press the **◀/▶ Navigation Button** **15** to change a default setting so that **OFF** is shown in highlighted video or to **ON** so that the original setting is restored and the auto polling is once again activated.

Since this setting is unique to each input, you must return to the **INPUT SETUP** menu to change any other inputs. To do that, press the **◀/▶ Navigation Button** **15** so that the cursor is pointing to the **BACK TO MASTER MENU** line and press the **Set Button** **17**. At the

MASTER MENU (Figure 1), press the **◀/▶ Navigation Button** **15** so that the cursor is pointing to the **IN/OUT SETUP** line. Press the **Set Button** **17** and then follow the instructions shown on page xx to change the input source. Return to the **ADVANCED MENU** to reconfigure the auto poll setting for the newly selected input.

When all changes to the Auto Poll settings have been made, press the **◀/▶ Navigation Button** **15** to select another configuration option on the **ADVANCED SETUP** Menu, move the cursor to **BACK TO MASTER MENU** line and press the **Set Button** **17** to make a change to another menu option, or simply press the **OSD Button** **31** to exit the menu system.

The AVR 435 is fully equipped to operate as the control center for a complete multiroom system that is capable of sending one source to a second zone in the house while a separate source is listened to in the main room. In addition to providing for control over the selection of the remote source and its volume, the AVR 435 offers a comprehensive range of options for powering the speakers in the second zone.

- Using the line-level **Multiroom Audio Outputs** 29, the selected source may be fed to optional, external power amplifiers that may be matched to the specifics of the installation.
- When the main room system is configured for 5.1 operation, the Surround Back Left/Right amplifier channels may be used to power the remote zone so that no additional amplifiers are required.
- Using built-in A-BUS Ready technology, optional A-BUS modules may be connected to the AVR 435 via a single Category 5/5e wire, so that remote zone speakers may be powered directly from the A-BUS module without the need for additional power, IR sensor or volume control wires to be run to the second zone.

In addition, the AVR 435 includes a remote IR sensor input so that remote control commands from the Zone II remote included with the unit may be transmitted to the unit, while standard IR input/output jacks allow the remote zone's commands to be sent to compatible IR-controlled source devices.

Installation

Although simple remote room systems may be installed by the average do-it-yourself hobbyist, the complexity of your multizone/multiroom system involves running wires inside of walls where the services of a specially trained installer may be required. Regardless of who does the work, please remember that local building codes may govern in-wall electrical work, including proper specification of any wiring used and the way in which it is connected. You are responsible for making certain that all multiroom installation work is done properly and in compliance with all applicable codes and regulations.

For standard installations, follow the instructions shown on pages 17–18 for the connection of speaker wire and IR remote wiring to the AVR 435.

For installations where the Surround Back Left/Right amplifier channels are used to power the remote zone, make certain that the system is configured for that type of operation, as shown on this page.

For installations where A-BUS modules are used, follow the instructions provided with the A-BUS remote modules or keypads. Additional information will also be made available through the Harman Kardon Web site at www.harmankardon.com.

RS-232 Control

The AVR 435 is rare among A/V receivers in that it provides the capability for full remote control from compatible computers or specialized remote control systems. RS-232 programming requires specialized programming knowledge and for that reason we recommend that it only be done by qualified installers. For more information on using the RS-232 port for remote control, visit the Harman Kardon Web site at www.harmankardon.com or contact our customer service department.

Multiroom Setup

Once the audio and IR link connections have been made, the AVR 435 needs to be configured for multiroom operation. Press the **OSD Button** 31 to bring the **MASTER MENU** (Figure 1) to the screen. Press the **Navigation Button** 15, until the on-screen **→** cursor is next to the **MULTI-ROOM** line. Press the **Set Button** 17 to enter the **MULTI-ROOM** menu (Figure 23).



Figure 23

When the **MULTI-ROOM** menu appears, the cursor will be at the **MULTI-ROOM** line. Since this line is used to turn the system on and off, don't make an adjustment here unless you wish to turn the system on at this time. To turn the system on, press the **Navigation Button** 15 so that **ON** is highlighted. If you do not wish to turn the system on at this time or to proceed to the next step, press the **Navigation Button** 15 once so that the **→** on-screen cursor is next to the **MULTI IN** line.

At the **MULTI IN** line, press the **Navigation Button** 15 until the desired input to the multiroom system appears in the highlighted video. When the selection has been made, press the **Navigation Button** 15 once so that the cursor is next to the **MULTI VOL** line.

At the **MULTI VOL** line, press the **Navigation Button** 15 until the desired volume level for the multiroom system is entered. **DO NOT** use the regular volume control knobs for this setting. When all settings for the multiroom setup have been made, press the **Navigation Button** 15 until the cursor is next to the **BACK TO MASTER MENU** line. If you have no other adjustments to make, press the **OSD Button** 31 to exit the menu system.

Surround Channel Amplifier Assignment

The AVR 435 is equipped with seven full-power amplifier channels to allow for complete 7.1-channel operation. However, if your system is only configured for 5.1 channels in the main listening room, you may take advantage of the "extra" two channels by using them to power speakers placed in a second zone location. This enables you to use the multiroom capabilities of the AVR 435 without the cost of an additional, external power amplifier.

To change the setting so that the Surround Back amplifiers are fed by the source selected through the Multiroom system rather than the SBL/SBR channels of the main room, make certain that the **MULTI-ROOM SETUP** menu (Figure 23) is on the screen, and then press the **Navigation Button** 15 so that the cursor is point to the **SB AMPS** line. Press the **Navigation Button** 15 so that **MULTI** is shown in highlighted video. When this change is made, connect the wires feeding the speakers in the remote zone to the **Surround Back/Multiroom Speaker Outlets** 10.

Note that when the SBL/SBR speakers are set for multiroom operation, you may still configure the AVR 435 for 7.1 modes in the main listening room by making certain that the **SURR BACK** line in the **SPEAKER SIZE** menu (Figure 15) is set to **SMALL** or **LARGE**, as shown in the instructions on page 27. When that is done the word **MULTI** will appear next to the large or small designator to alert you to the fact that the internal SBL/SBR amplifiers are assigned to the multiroom system, and that an optional, external two-channel power amplifier must be connected to the **SBL/SBR Preamp Outputs** 3 in order to use surround back channel speakers.

Once this setting is made, press the **Navigation Button** 15 to select another configuration item on this page, or press the **OSD Button** 31 if you have completed your adjustments to the Multiroom system.

MULTIROOM OPERATION

Multiroom Operation

When operating the AVR 435 from a remote room location where an IR sensor link has been connected to the AVR 435's rear panel **Multiroom IR Input 25**, you may use either the main remote control or the Zone II remote. To turn on the multiroom feed, press the **AVR Selector 5 B** to turn the unit on to the last source, or any of the other **Selector Buttons C D 4 34 44** to turn on to a specific source.

As long as an IR feed to the AVR 435 has been established from the remote room, using any of the buttons on either remote will control the remote location volume **18 I**, change the tuner frequency **23 E**, change the tuner preset **22 C** or mute the output **33 K**.

If the **Remote IR Output Jack 27** on the AVR 435 is connected to an IR Input jack on compatible Harman Kardon audio components such as CD, DVD or cassette players, the transport functions of those machines may also be controlled using the **Transport Controls 20 21 F G H J** on either remote control.

To turn the system off from the remote room, press the **Power Off Button 1 A**. Remember that the AVR 435 may be turned on or off from the remote room, regardless of the system's operation or status in the main room.

NOTE: When the tuner is selected as the source for the remote zone, any change to the frequency or preset will also change the station being listened to in the main room, if the tuner is in use there. Similarly, if someone in the main room changes the station, the change will also have an impact on the remote room.

To turn on the Multiroom system from the main listening room, which is necessary before any A-BUS products connected to the AVR may be used, press the **Multiroom Button 27** on the remote. When the **MULTI ON / OFF** message appears in the on-screen display and the **Lower Display Line 14**, press the **Set Button 17** and then press the **▲/▼ Navigation Button 15** so that display changes to **MULTI ON**. Press the **Set Button 17** again to activate the setting. Note that this method may be used to turn the Multiroom system on or off even when the AVR is in the Standby mode in the main listening room.

When the Multiroom system is turned on, the input selected using the Multiroom menu will be fed to the **Multiroom Audio Outputs 29** on the rear panel as well as the **A-BUS Connector 5**. The volume will be as set in the previous selection, although it may also be

adjusted using an optional IR sensor and the Zone II remote in the remote location, or the A-BUS keypad, or on the optional audio power amplifier connected to the **Multiroom Audio Outputs 29**.

Although changes to the input source or remote room volume will normally be made using an IR sensor in the remote room that is connected to the AVR, it is also possible to change those settings from the main listening room. This is useful for situations where some or all of the remote rooms do not have an IR sensor, or to take control over the remote room without actually being in that room.

In addition to using the **MULTIROOM** menu, as shown on the previous page, you may change the source or volume in the remote zone using the remote. Press the **Multiroom Button 27** on the remote, and when the **MULTI ON / OFF** message appears in the on-screen display and the **Lower Display Line 14**, press the **Set Button 17** and then press the **▲/▼ Navigation Button 15** to toggle past that message to **MULTI LEVEL** or **MULTI INPUT**.

To change the remote room's input source, when **MULTI INPUT** appears, press the **Set Button 17**, and then press the **▲/▼ Navigation Button 15** until the desired input appears in the on-screen display and in the **Lower Display Line 14**. Remember that only analog or PCM input sources may be selected for use with the Multiroom system. Dolby Digital or DTS sources are not available to the Multiroom system.

To change the remote room's volume, when **MULTI LEVEL** appears, press the **Set Button 17**, and press the **▲/▼ Navigation Button 15** to change the volume setting. Note that this volume adjustment controls the level for the output to the **Multiroom Audio Outputs 29** and for any speakers connected to the **Surround Back/Multiroom Speaker Outputs 10** when the Surround Back amplifier channels are configured for Multiroom use, as shown on page 41. This adjustment does NOT change the volume level for any room where an A-BUS module is used, as that setting is only adjustable using the A-BUS module's volume control or a remote pointed at the A BUS module's built-in sensor.

Once the Multiroom system is turned on, it will remain on even if the AVR 435 is placed in the Standby mode in the main room by pressing the **Power Off Button A** or the **Main Power Switch A** on the front panel.

The Multiroom system will remain on even if the unit is turned off in the main room. In that event, although

front-panel indicators and the accent lighting around the volume control will turn off, a **MULTI ON** message will remain in the **Lower Display Line 14** and the lighting around the Standby/On switch will remain blue when the unit is in the Standby mode in the main room to remind you that power is still applied to the unit, and that it is being used for Multiroom operation elsewhere in the house. Remember that if you turn the unit completely off by pressing the **Main Power Switch A**, the feed to the second zone will also be turned off.

When the AVR 435 is turned off in the main room, the Multiroom system may be turned on at any time by pressing the **Multiroom Button 27**, or any of the **Selector Buttons B C D** in the remote room.

CONFIGURING THE REMOTE

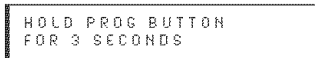
The AVR 435 remote is factory-programmed for all functions needed to operate the unit. In addition, it is also preprogrammed to operate most recent Harman Kardon DVD players and changers, CD players and changers, CD recorders and cassette decks. The codes for other brand devices may be programmed into the AVR 435 remote using its extensive library of remote codes or a head-to-head learning process for codes not in the internal library.

Thanks to the remote's advanced technology and two-line LCD display, it is no longer necessary to look up cumbersome codes when programming the remote; following the steps outlined below, you simply search for the brand name from the remote's memory. We recommend that you first try the preprogrammed code entry method. If that procedure is not successful, then try the code-learning method.

Preprogrammed Code Entry

The easiest way to program the remote for operation with a source device from another brand is to follow these steps:

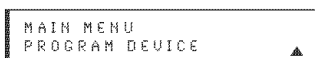
1. Turn on the power to the device you wish to program into the AVR remote. This is important, as in a later step you will need to see whether the device turns off to determine whether the remote has been programmed for the proper remote codes.
2. Press and hold the **Program Button** **25** for about three seconds while the message shown in Figure 24 appears in the remote's **LCD Information Display** **3**. Release the button when the red light under the **Set Button** **17** appears.



HOLD PROG BUTTON
FOR 3 SECONDS

Figure 24

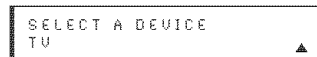
3. The remote's **MAIN MENU** message (Figure 25), will appear in the LCD display and the **Set Button** **17** will remain illuminated in red. Press the **Set Button** **17** to begin the process of selecting a device and locating the proper remote codes.



MAIN MENU
PROGRAM DEVICE

Figure 25

4. **SELECT A DEVICE** will appear in the LCD display (Figure 26). Press the **▲/▼ Navigation Button** **15** to scroll through the list of device categories and press the **Set Button** **17** when the device you wish to set the codes for appears. For this example, we will select "TV" to enter the codes needed to operate your TV.

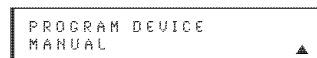


SELECT A DEVICE
TV

Figure 26

NOTE: The codes for hard-drive recorder products (PVR) such as TIVO® and Replay TV® are programmed by selecting VCR as the device. For satellite-based TIVO products, check under the brand name of the product.

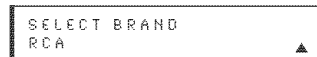
5. At the next menu screen on the remote (Fig. 27), press the **Set Button** **17** to enter the Manual mode, which means that you will select the brand name of the device from the list programmed into the remote's memory.



PROGRAM DEVICE
MANUAL

Figure 27


6. The next menu screen on the remote (Figure 28) will show the start of the list of available brands. Press the **▲/▼ Navigation Buttons** **15** until the brand name of the device you are programming into the remote appears on the lower line of the display and then press the **Set Button** **17**.

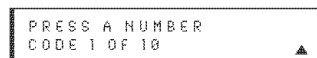


SELECT BRAND
RCA

Figure 28

NOTE: If the brand name for the product you wish to program does not appear in the list, the codes may still be available, as some manufacturers share codes. If the desired brand is not listed, press the **Clear Button** **10** to exit the programming process, and skip to the instructions shown on page 44 for the "Automatic" method of programming the remote. If desired, or if the codes for your brand are not part of the remote's library at all, you may still use the remote to program most infrared-controlled products by "learning" the commands from the product's original remote into the AVR remote. The instructions for Learning Commands are on page 44.

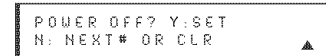
7. The next step is important, as it determines which codes will operate the source device or display. Point the AVR remote at the device being programmed and, following the instructions shown in the remote's **LCD Information Display** **3**, press and release the **Numeric Keys** **11** shown on the menu screen (Figure 29) one at a time, starting with the "1" button. After you press the "1" **Button** **11**, the remote's LCD screen will briefly go blank as the code is being transmitted, but you will see the "transmit" icon  in the upper right corner of the display to serve as confirmation that the remote is sending out commands.



PRESS A NUMBER
CODE 1 OF 10

Figure 29

8. After you press and release the number key, watch the device being programmed to see whether it turns off. As shown in the instructions that will appear on the next menu screen (Figure 30), if your device has turned off, press the **Set Button** **17**, and then skip to Step 10. If the unit does *not* turn off, proceed to the next step.



POWER OFF? Y: SET
N: NEXT# OR CLR

Figure 30

9. If the device being programmed into the AVR remote does *not* turn off after you have pressed the "1" **Button** **11**, repeat Steps 7 and 8 by pressing the available numeric keys shown until the device turns off. If the device still does not turn off after all choices have been tried, or if there is only one number key shown as available to try, the code for this specific device is not in the AVR remote library under that brand name. If that is the case, press the **Clear Button** **10** to exit the manual programming mode. Remember that the codes may still be stored in the AVR remote's library under another brand, and you can have the remote control search for them by following the instructions below for automatic programming. You may also manually "learn" the codes for most devices into the AVR remote by following the Learning Commands instructions on page 44.
10. When the device being programmed does turn off after a numeric key has been pressed, you must press the **Set Button** **17** within five seconds to enter the setting into the remote's memory. After you press the **Set Button** **17**, the top line of the LCD display will read **SAVING...** and then the word **SAVED** will flash four times in the center of the bottom line.

11. When the codes are saved, the remote will return to normal operation, and whenever you press the **Input Selector Button** **4** that was just programmed, the codes for the new device will be used. If no further buttons are pressed, the remote will revert back to the default setting for AVR commands.

NOTE: Some brands share a common remote control code for "Power Off" for many models. For that reason it is possible that even though the remote appears to be properly programmed, you may find that some buttons do not appear to issue the correct command. If this is the case, repeat the procedure outlined above, but if more than one numeric key selection is suggested in Step 7, try a different number to see whether the remote operates correctly. Although the AVR remote is preprogrammed with an extensive library of codes for many major brands, it is also possible that you may have attempted to program a product that is too new

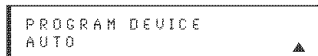
CONFIGURING THE REMOTE

or too old, and thus not all of its commands will be in the code library. You may fill in the codes for any button that does not operate properly by using the learning technique shown on this page.

Automatic Code Entry

In addition to manual code selection using the brand name list, it is also possible to automatically search through all the codes that are stored in the AVR remote's library to see whether a device will respond even if it is not listed among the brands that appear when you program the remote manually. To automatically search through the codes that are available for a specific device type (e.g., DVD, VCR), follow these steps:

1. Turn on the power to the device you wish to program into the AVR remote. This is important because in a later step you will need to see whether the device turns off to determine whether the remote has been programmed for the proper remote codes.
2. Press and hold the **Program Button 25** for about three seconds while the message shown in Figure 24 appears in the remote's **LCD Information Display 3**. Release the button when the red light under the **Set Button 17** appears.
3. The remote's **MAIN MENU** message (Fig. 25) will appear in the LCD display and the **Set Button 17** will remain illuminated in red. Press the **Set Button 17** to begin the process of selecting a device and locating the proper remote codes.
4. **SELECT A DEVICE** will appear in the LCD display (Figure 26). Press the **▲/▼ Navigation Button 15** to scroll through the list of device categories and press the **Set Button 17** when the device for which you wish to set the codes appears. For this example, we will select "TV" to enter the codes needed to operate your TV.
5. At the next menu screen on the remote, press the **▲ Navigation Button 15** so that the bottom line of the LCD display reads **AUTO** (Figure 31) and then press the **Set Button 17** to enter the Automatic programming mode.



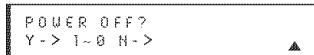
```
PROGRAM DEVICE
AUTO
```

Figure 31

6. As instructed on the next menu screen, press the **▲ Navigation Button 15** to begin the automatic code search process. Your confirmation that the remote is sending out commands is the movement of a square block across the top line of the LCD display screen while the bottom line reads **PLEASE WAIT...** You will also see the transmit icon in the upper right corner of the LCD

display's top line to remind you that the remote is working even though you may not see anything happening to the device being programmed.

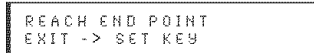
7. It will take a few seconds for the remote to send out the first group of commands, after which you will see a new display in the LCD screen, as shown in Figure 32. Following the instructions, if the device being programmed has *not* turned off, press the **▲ Navigation Button 15** again to send another group of codes. If the device being programmed *has* turned off, skip to Step 9.



```
POWER OFF?
Y-> 1-0 N->
```

Figure 32

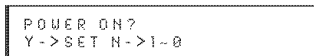
8. By pressing the **▲ Navigation Button 15** again, the remote will send out a new set of commands. When it pauses, follow the instructions shown in Step 7. Depending on how many codes are stored for a specific device type, you may have to repeat this process as many as 15 times. Remember, if the device turns off, skip to Step 9. When all the codes for the device being programmed have been tried, the instruction shown in Figure 33 will appear. This means that the codes for the product you are trying to program are not in the AVR remote library and you will have to "learn" them into the remote following the instructions shown in the next section. Press the **Set Button 17** as instructed to exit the programming process.



```
REACH END POINT
EXIT -> SET KEY
```

Figure 33

9. If the device being programmed *does* turn off after following the instructions in Step 7, you will need to verify the code set by pressing the **Numeric Keys 11** in sequence, as instructed in Figure 32. Point the remote at the device being programmed, and press the **"1" Button 11** to see whether the device turns back on.
10. After pressing and releasing the **"1" Button 11**, check to see whether the device has turned back on. If it has, skip to Step 12. If it does not turn off, press the **"2" Button 11**, or the next button in the numeric sequence if you are repeating the procedure, as instructed by the LCD screen in Figure 34.



```
POWER ON?
Y-> SET N-> 1-0
```

Figure 34

11. When pressing the "1" button does not turn the device being programmed back on, repeat the procedure by trying the remainder of the **Numeric Keys 11** in sequence, each time

pressing and then releasing the button to see whether the new device turns back on. When it does, skip to the next step. However, if you try all 10 numeric keys and find that the unit will not turn on, you won't be able to use this method to program the device. Press the **Clear Button 10** to exit the programming process. You'll need to follow the Learning Commands instructions below to enter the codes for this device into the AVR remote.

12. When pressing one of the numeric keys in Step 10 or 11 causes the device being programmed to turn back on, follow the instructions shown in Figure 32 and press the **Set Button 17** within five seconds of the device turning on. After you press the Set button, the top line of the LCD display will read **SAVING...** and then the word **SAVED** will flash four times in the center of the bottom line.
13. When the codes are saved, the remote will return to normal operation, and whenever you press the **Input Selector Button 4** that was just programmed, the codes for the new device will be used. If no further buttons are pressed, the remote will revert back to the default setting for AVR commands.

Learning Commands

On occasions when the AVR remote does not contain the codes for a particular product's remote in its built-in library, or when you wish to program a missing or special function into one button of a device, the AVR remote's learning capability allows you to do that. To teach commands from one product's remote into the AVR remote:

The AVR 435's remote not only allows you to "learn" in the commands from any compatible remote; it also allows you to learn a separate code into the **Input Selector Buttons 4**. This unique capability allows you to configure the remote so that whenever one of these buttons is pressed, the remote will not only select the codes for that device for itself, but it will transmit a separately programmed remote code. This is particularly valuable when your system includes a source such as a cable box, satellite receiver or DVD player with an HDMI or DVI output that is connected directly to your video display. By programming the *display's* input selection remote code for the specific device, you can, for example, press the **VID 3/Cable Input Selector Button 4** and not only have the AVR switch to a cable set-top for audio selection and have the AVR remote use remote codes for the cable box, but you can send a code to the display that selects the HDMI or DVI input used for a direct connection between the set-top and your display.

Before learning codes, note that all buttons on the remote may have a command "learned" except for

Clear **10**, Program **25**, Light **26** and the Macro Buttons **28**.

The learning process requires that both the device's original remote and the AVR remote be available. Before pressing any buttons on either remote, place them so that the IR transmitter on the remote from the device to be programmed is facing the **Infrared Lens 47** on the AVR remote. The two remotes should be no more than an inch apart, and there should not be any direct sunlight or other bright light source near the remotes.

Learning Keys for an Entire Device Remote

1. Press and hold the **Program Button 25** for about three seconds while the message shown in Figure 24 appears in the remote's **LCD Information Display 3**. Release the button when the red light under the **Set Button 17** appears.
2. The remote's **MAIN MENU** message (Fig. 25), will appear in the LCD display and the **Set Button 17** will remain illuminated in red. Press the **Navigation Button 15** once so that **LEARN** appears on the bottom line of the LCD screen, as shown in Figure 35. Press the **Set Button 17** to begin the process of learning commands from another device's remote into the AVR remote.

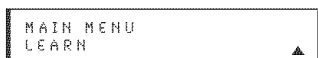


Figure 35

3. To program the codes for a device's remote into the AVR remote, press the **Navigation Buttons 15** until the words **LEARN KEY** appear in the bottom line of the LCD display, as shown in Figure 36. Press the **Set Button 17** to continue. If you wish to program one of the Input Selector buttons for a special code, follow the instructions shown below for "Device Selector Programming".

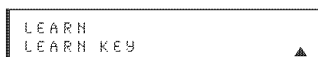


Figure 36

4. The **SELECT A DEVICE** message will appear in the LCD display (Figure 26). Press the **Navigation Buttons 15** to scroll through the list of device categories and press the **Set Button 17** when the device for which you wish to set the codes appears. For this example, we will select "TV" to enter the codes needed to operate your TV.

5. The next menu screen (Figure 37) will prompt you to select the button, or "key," on the AVR remote that you wish to program. Press that button on the AVR remote.

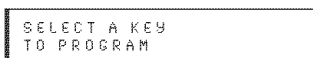


Figure 37

6. Once you press the button to be programmed on the AVR remote, press and hold the button on the remote control for the device to be programmed within 5 seconds, as instructed on the next menu screen (Figure 38).

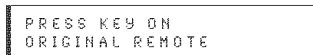


Figure 38

7. Continue to hold the button on the original remote until the menu on the AVR remote's LCD screen changes. If the code is successfully learned, you will see the display shown in Figure 39. If you see that message, proceed to Step 10. If the code is *not* successfully learned, you will see the display shown in Figure 40. If that menu appears, proceed to Steps 8 and 9.

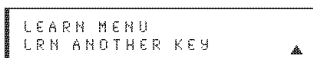


Figure 39

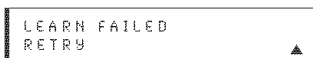


Figure 40

8. If the message shown in Figure 40 appears in the display, press the **Set Button 17** to try programming the button again. When the remote prompts you to press and hold the key on the original remote again by showing the display shown in Figure 38, immediately press the button on the source remote again. To avoid another failed attempt, make certain that the windows on the two remotes are facing one another.

9. Continue to hold the button on the original remote until the LCD display changes again. If the code was successfully learned, you will see the display shown in Figure 39. In that case, go to Step 10. If the **LEARN FAILED** display (Figure 40) appears again, you may either try to program the key again, or press the **Navigation Button 15** to stop the process. It is possible that some remotes may use code sequences or infrared frequencies that are not compatible with the AVR remote, and those codes cannot be learned. When the display shown in Figure 41 appears, press the **Set Button 17** to exit the Learning system.

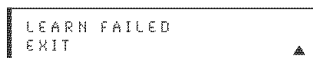


Figure 41

10. When a code has been learned successfully, you have a number of options. When the display shown in Figure 39 is on the LCD screen on the

AVR remote, you may press the **Set Button 17** to learn additional codes from the buttons on a source remote into the AVR remote. Follow Steps 5 through 9 as often as needed to complete the code-learning process.

11. If you wish to change the name that appears in the LCD display when the button that has just had a new code learned is pressed, press the **Navigation Button 15** so that the display shown in Figure 42 appears in the LCD display. Press the **Set Button 17** to be taken to a **RENAME KEY** display. Enter the new name for the key following the instructions shown in the Renaming Individual Keys section of this manual on pages 50–51. If you find it more convenient to rename the buttons at a later time, you may do that separately by following the instructions on page 50.

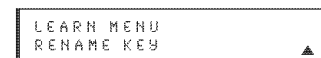


Figure 42

12. When you have programmed all keys for the desired device, press the **Navigation Button 15** when **LEARN MENU** (Figure 39) appears so that you see the display shown in Figure 43. Press the **Set Button 17** to return the remote to normal operation.

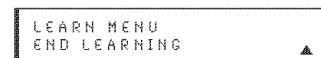


Figure 43

13. If you wish to program the codes for another device, repeat the procedure outline above, but select a different device in Step 4.

Learning Codes for an Input Selector

The AVR 435's remote allows you to learn a specific code to be attached to one of the **Input Selectors 4** so that whenever that button is pressed, you will not only be selecting that device as the AVR's input and telling the remote to use the remote codes that have been programmed to belong to that device, it also allows you to have that special code transmitted, as well. This allows you to have an input (or other command) sent to a display so that when video sources are directly connected to the display, you can automatically command it to switch to the same input selected for the AVR.

To learn a remote code into one of the **Input Selectors 4**, follow the same steps shown above for learning the keys for an entire device remote with the following exceptions:

- In Step 3, press the **Navigation Buttons 15** until **LEARN DEVICE** appears in the bottom line of the LCD display.

CONFIGURING THE REMOTE

- When the **SELECT A DEVICE** message (Figure 26) appears, as described in Step 4, press the specific **Input Selector Button 4** that you wish to have transmit a special code when it is pressed.
- When the **RENAME DEVICE** option is offered by the remote after the code is programmed, you will be changing the name that is shown in the remote's LCD display every time that Input Selector is pressed.

Changing Devices

In the factory default settings, the AVR remote is programmed so that the commands transmitted correspond to the device selected by pressing one of the **Input Selectors 4**. This is logical, as you want the remote to control the device you have selected. However, in some circumstances you may have configured your system so that the devices connected to the AVR 435 do not correspond to the default device settings and the legends printed on the remote. For example, if your system has two VCRs you may connect the second VCR to the VID 2 input. There is no problem in doing that, but in normal operation the commands issued after selecting the VID 2 input are for a television, not a VCR.

The AVR remote allows you to correct that situation through the "Changing Devices" process. This enables you to assign the codes from one type of device to a different button. For example, in the steps below, we will explain how to program the VID 2 buttons to provide the commands to operate a VCR. Of course, you may program the remote to have any of the devices take on the code set of any other device, as your system requires. And, with the AVR remote's "Rename" function, you can even change the way the name of the device appears on the remote's LCD display so that you see exactly which commands are being sent.

To program the buttons normally assigned to one device for the commands of another, follow these steps:

1. Press and hold the **Program Button 25** for about three seconds while the message shown in Figure 24 appears in the remote's **LCD Information Display 3**. Release the button when the red light under the **Set Button 17** appears.
2. The remote's **MAIN MENU** message (Fig. 25), will appear in the LCD display and the **Set Button 17** will remain illuminated in red. Press the **▲ Navigation Button 15** twice so that **CHANGE DEVICE** appears on the bottom line of the LCD screen, as shown in Figure 44. Press the **Set Button 17** to begin the process of

reassigning the commands used for a particular device.

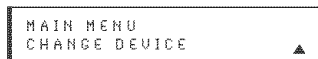


Figure 44

3. The next menu display is where you select the Input Select, or device, that you wish to change. When the display shown in Figure 45 appears, press the **▲/▼ Navigation Button 15** to scroll through the list to find the device you wish to use for another function. In this case we will select "TV," and show how to change it to take on the codes for operating a VCR. When that device's name appears, press the **Set Button 17**.

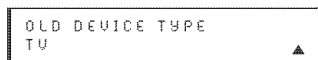


Figure 45

4. Once the "old" device type has been selected, you need to tell the remote which set of remote codes to use as a replacement for the device just selected. When the instructions shown in Figure 46 appear, press the **▲/▼ Navigation Button 15** to scroll through the list of device categories to find the name of the device that you wish to use. The old device name will remain on the left side of the LCD screen, while the replacement device list will scroll to its right. For example, press the **▲ Navigation Button 15** until the display screen reads **TV<-VCR** to have the VID 2/TV Button transmit the commands used to control a VCR. Press the **Set Button 17** when the desired device combination appears.

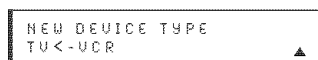


Figure 46

5. Once the new device is selected, the remainder of the process will select the codes for the specific brand to be used, and for that reason they are identical to the way a device is programmed using manual entry. Continue the process as outlined in the next few steps, remembering that if the codes for your specific device are not found, you may select any brand and then "learn" the proper codes into the AVR remote using the process outlined on page 44. To begin the process, start by selecting the brand of device, as shown in Fig. 28. Press the **▲/▼ Navigation Button 15** until the brand name of the device you are programming into the remote appears on the lower line of the display and then press the **Set Button 17**.
6. The next step is important, as it determines which codes will operate the source device or display. Point the AVR remote at the device being programmed and, following the instructions shown

on the remote's **LCD Information Display 3**, press and release the **Numeric Keys 11** one at a time, starting with the "1" **Button 11**. After you press the "1" **Button 11**, the remote's LCD screen will briefly go blank as the code is being transmitted, but you will see the "transmit" icon in the upper right corner of the display to serve as confirmation that the remote is sending out commands.

7. After you press and release the number key, watch the device being programmed to see whether it turns off. As shown in the instructions that will appear on the next menu screen (Fig. 30), press the **Set Button 17**, and then skip to Step 9. If the unit does *not* turn off, proceed to the next step.
8. If the device being programmed into the AVR remote does *not* turn off after you have pressed the "1" **Button 11**, continue Steps 6 and 7 by pressing the available numeric keys shown until the device turns off. If the device still does not turn off after all choices have been tried, the code for this specific device is not in the AVR remote library under that brand name. If that is the case, we suggest that you press the **Set Button 17** to accept the codes from another brand so that the programming is completed, but remember that you will then have to program the remote manually by following the Learning Commands instructions on page 44.
9. When the device being programmed does turn off after a numeric key has been pressed, you must press the **Set Button 17** within five seconds to enter the setting into the remote's memory. After you press the Set button, the top line of the LCD display will read **SAVING...** and then the word **SAVED** will flash four times in the center of the bottom line.
10. When the codes are saved the remote will return to normal operation, and whenever you press the **Input Selector Button 4** that was just programmed, the display will show the original device type code at the far left side of the display, with the name of the new code set type in brackets. For example, the display will read **TV<-VCR** in our example of replacing the TV codes with those for a VCR.

Macro Programming

Macros enable you to easily repeat frequently used combinations of multiple remote control commands with the touch of a single button. Once a macro is programmed, you may send up to 20 commands with one press of the Power On or Macro buttons. This will greatly simplify the process of turning on your system,

changing devices or other common tasks. Thanks to the remote's two-line display, it is easier than ever for you to take advantage of the power of macro commands.

Recording a Macro

To record a macro into the remote's memory, follow these steps:

1. Press and hold the **Program Button 25** for about three seconds while the message shown in Figure 24 appears in the remote's **LCD Information Display 3**. Release the button when the red light under the **Set Button 17** appears.
2. The remote's **MAIN MENU** message (Fig. 25), will appear in the LCD display and the **Set Button 17** will remain illuminated in red. Press the **Navigation Button 15** three times so that **MACRO** appears on the bottom line of the LCD screen, as shown in Figure 47. Press the **Set Button 17** to enter the main macro menu branch.

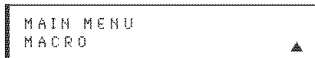


Figure 47

3. At the next menu screen (Figure 48) press the **Set Button 17** to begin recording a macro.

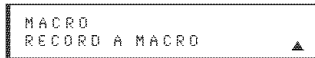


Figure 48

4. The next display screen (Figure 49) is where you select the button that will be used to recall the macro. The choices are the **Power On Button 2** or one of the discrete **Macro Buttons 28**. Press the **Navigation Button 15** until the name of the button you wish to program the macro into is shown. For this example we will show how to program a series of commands that will automatically be sent out every time the Power button is pressed.

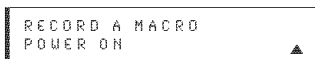


Figure 49

5. The next screen that appears (Figure 50) is where you select the device for the first command that will be sent out as part of the macro. Press the **Navigation Button 15** until the name of the device appears on the left side of the lower line in the LCD display. For this example, the first button we want to have the macro "press" is the Power On button, so the AVR device is selected. Press the **Set Button 17** when the desired device name appears to move to the next programming step.

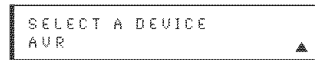


Figure 50

6. The next display (Figure 51) is where you begin entering the individual commands for the macro, in the order you wish them to be transmitted. Remember that when you want to change devices, you must first press the **Input Selectors 4** for that button, and then press the Command or Function key. Since we want to program a series of events that occur each time the Power On button is pressed, press the AVR button. In your specific macro, this is the first command button.

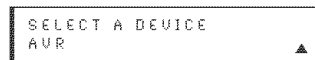


Figure 51

7. The next display (Figure 52) and the subsequent screens are where the actual macro programming takes place. The words at the left side of the top line of the display show the button that is being programmed (e.g., the **Power On Button 2** or one of the **Macro Buttons 28**) and the indication at the right side of the top line shows the number of macro steps available of 20 possible steps. Following the instructions on the remote's LCD screen, press the first key you wish to be transmitted in the macro. In our example, we first want the AVR 435 to turn on, so the **Power Button 2** should be pressed.

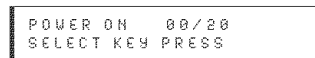


Figure 52

8. Once the first command button for the macro has been pressed, continue to press the buttons you wish to be part of the macro, in the order they will be used. Press each button within five seconds of the last button, remembering to press the **Input Selector 4** when you are changing device functions. As the buttons on the remote are pressed, the remote's display screen will show the steps in the macro as they are programmed (Figure 53).

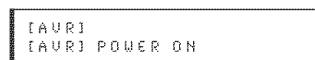


Figure 53

9. For our example, we first want the AVR Power On button pressed, followed by the TV Power On, followed by the Cable Box On, followed by the selection of the Logic 7 mode. To do that, press the buttons in this order:

- **Power On 2**
- **VID 2/TV 4**
- **Power On 2**

- **VID 3/Cable 4**
- **Power On 2**
- **AVR 5**
- **Logic 7 8**

As each button is pressed to enter it into the macro, you will see the button names appear and then scroll up on the LCD display as your confirmation of the key entry (Figure 53).

10. When all commands for the macro have been entered, press the **Set Button 17** to save the macro. The display screen will show the button to which the macro has been programmed and the number of steps used, and the word **SAVED** will blink four times in the lower line of the LCD display. When the display returns to normal, the macro has been entered and the remote is ready for operation.

11. If a macro has been programmed into the **Power On Button 2**, it will play back anytime the Power On button is pressed. As the macro plays, you will see the steps appear in the remote's LCD display. Macros programmed into one of the four discrete Macro buttons may be activated at any time by pressing the appropriate button.

Erasing a Macro

Once a macro has been created and stored in the AVR remote's memory, you have the option of erasing it. You may do this at any time by following these steps:

1. Press and hold the **Program Button 25** for about three seconds while the message shown in Figure 24 appears in the remote's **LCD Information Display 3**. Release the button when the red light under the **Set Button 17** appears.
2. The remote's **MAIN MENU** message (Fig. 25), will appear in the LCD display and the **Set Button 17** will remain illuminated in red. Press the **Navigation Button 15** three times so that **MACRO** appears on the bottom line of the LCD screen, as shown in Figure 47. Press the **Set Button 17** to enter the main macro menu branch.
3. At the next menu screen (Figure 54), press the **Navigation Button 15** until the bottom line in the remote's LCD display reads **ERASE A MACRO**. Press the **Set Button 17** to begin the process of erasing a macro.

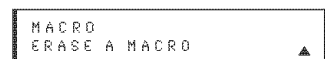


Figure 54

CONFIGURING THE REMOTE

- The next display screen (Figure 55) is where you select which macro will be erased. Press the ▲/▼ **Navigation Button 15** until the number of the macro you wish to erase appears. For this example, we will erase the Power On macro created in the previous section. When the name of the macro to be erased appears, press the **Set Button 17**.

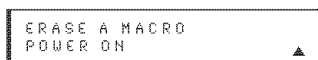


Figure 55

- The word **ERASED** will flash four times in the bottom line of the remote's LCD display, and then the display will return to its normal condition. When that happens, the macro is erased and the remote is returned to normal operation.

Read a Macro

To check the commands stored in the remote's memory for one of the buttons, follow these steps:

- Press and hold the **Program Button 25** for about three seconds while the message shown in Figure 24 appears in the remote's **LCD Information Display 3**. Release the button when the red light under the **Set Button 17** appears.
- The remote's **MAIN MENU** message (Fig. 25), will appear in the LCD display and the **Set Button 17** will remain illuminated in red. Press the ▲ **Navigation Button 15** three times so that **MACRO** appears on the bottom line of the LCD screen, as shown in Figure 47. Press the **Set Button 17** to enter the main macro menu branch.
- At the next menu screen (Figure 56), press the ▲/▼ **Navigation Button 15** until the bottom line in the remote's LCD display shows **READ A MACRO**. Press the **Set Button 17** to begin the process of erasing a macro.

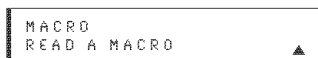


Figure 56

- The next display screen (Figure 57) is where you select the macro to be read. Press the ▲/▼ **Navigation Button 15** until the name of the macro you wish to read appears. For this example, we will read back the Power On macro created in a previous section. When the name of the macro to be erased appears, press the **Set Button 17**.

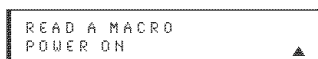


Figure 57

- As soon as the Set button is pressed, the first two steps in the macro will be appear in the remote's LCD screen. You may then use the ▲/▼ **Navigation Button 15** to step up or down through the list of commands stored as the macro. As you read the display, you will see **Input Selector Buttons 4** appear in brackets, (e.g., **[AUR]**). When the step in the macro is a function, navigation or any other button, it will appear next to the bracketed read-out of the underlying device (e.g., **[AUR] POWER ON**).

- When you are finished reviewing the macro's contents, press the **Set Button 17** to return the remote to normal operation.

Punch-Through Configuration

Punch-through is a capability of the remote that allows the Volume controls, Channel Up/Down buttons or Transport keys (Play, Stop, Record, Fast Forward and Reverse, and Skip Up/Down) to link to a different device. For example, if your TV, cable box or satellite receiver is connected through the AVR 435, you will most likely want to use the AVR 435's volume control commands even when the remote has been set to issue all other commands for the video device. "Punch-through" enables you to easily program the remote to do this.

Volume Punch-Through

Follow these steps to enable the Volume Up/Down and Mute controls from one device to be used when the remote is otherwise programmed for a different device.

NOTE FOR VOLUME PUNCH-THROUGH: The remote's default settings are for the AVR 435's volume controls, to be used when any input or device is selected, with the exception of the VID 2/TV button. There is no need to program the remote for volume punch-through for the AVR 435's controls with other sources, such as DVD. To have the AVR 435's volume commands used when the TV device is selected, follow these steps:

- Press and hold the **Program Button 25** for about three seconds while the message shown in Figure 24 appears in the remote's **LCD Information Display 3**. Release the button when the red light under the **Set Button 17** appears.
- The remote's **MAIN MENU** message (Fig. 25), will appear in the LCD display and the **Set Button 17** will remain illuminated in red. Press the ▲/▼ **Navigation Button 15** until **PUNCH-THROUGH** appears on the bottom line of the LCD screen, as shown in Figure 58. Press the

- Set Button 17** to enter the main punch-through menu branch.

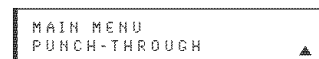


Figure 58

- At the next menu screen (Figure 59) press the **Set Button 17** to begin programming the remote for Volume punch-through.

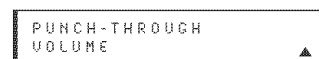


Figure 59

- The next display screen (Figure 60) is where you select the device that will receive the punch-through commands. In our example, that is the VID 2/TV button, as that is where we want the AVR 435's volume controls to be active. Press the ▲/▼ **Navigation Button 15** until the name of the base device appears and then press the **Set Button 17**.

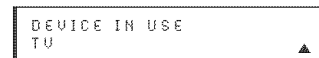


Figure 60

- At the next display screen (Figure 61), you will select the device whose Volume Up/Down and Mute commands will be used. Press the ▲/▼ **Navigation Button 15** until the desired device's name appears to the right of the device in use. In our example, that is the AVR 435 (indicated by **AUR**). When the desired combination of devices appears, press the **Set Button 17**.

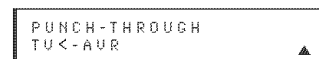


Figure 61

- When the Set button is pressed, the display will change to show you that the new combination of control commands is being saved to the unit's memory, as shown in Figure 62. The word **SAVED** will flash four times and then the remote will return to normal operation.

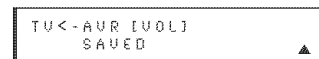


Figure 62

- Once the punch-through is programmed, the Volume Up/Down and Mute buttons of the second device named will be used when those buttons **18 33** are pressed while the master device is in use.

Returning the Volume Control Settings to Default Operation

If you wish to remove the Volume punch-through so that the commands for Volume and Mute are returned to the factory default setting, follow the steps shown

above, except that in Steps 4 and 5, select the same device for both the **DEVICE IN USE** on the left side of the bottom line and the **PUNCH-THROUGH** device. In the example used, the display to return the remote to default settings will appear as shown in Figure 63.

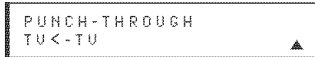


Figure 63

Channel Punch-Through

Channel punch-through allows the Channel Up/Down buttons to send commands to a different device than the one selected for other commands. For example, you may wish to use a cable box or satellite receiver as the source for a VCR, so you would want the Channel Up/Down Buttons **35** to transmit commands to the cable box even though the other button commands are programmed to operate the VCR.

To program the remote for channel punch-through, follow these steps. This example will show how to program channel punch-through so that the commands programmed for Channel Up/Down for the VID 3/Cable device will be transmitted when the VID 1/VCR device has been selected as the current device.

1. Press and hold the **Program Button 25** for about three seconds while the message shown in Figure 24 appears in the remote's **LCD Information Display 3**. Release the button when the red light under the **Set Button 17** appears.
2. The remote's **MAIN MENU** message (Fig. 25), will appear in the LCD display and the **Set Button 17** will remain illuminated in red. Press the **▲/▼ Navigation Button 15** until **PUNCH-THROUGH** appears on the bottom line of the LCD screen, as shown in Figure 58. Press the **Set Button 17** to enter the main punch-through menu branch.
3. At the next menu screen, press the **▲/▼ Navigation Button 15** until **CHANNEL** appears on the bottom line of the LCD screen, as shown in Figure 64. Press the **Set Button 17** to begin programming the remote for Channel punch-through.

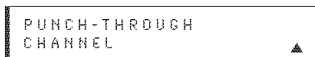


Figure 64

4. The next display screen (Figure 65) is where you select the device that will receive the punch-through commands. In our example, that is the VID 2/TV button, as that is where we want the cable box's channel controls to be active. Press

the **▲/▼ Navigation Button 15** until the name of the base device appears and then press the **Set Button 17**.

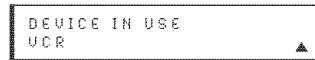


Figure 65

5. At the next display screen (Figure 66), you will select the device whose Channel Up/Down commands will be used. Press the **▲/▼ Navigation Button 15** until the desired device name appears to the right of the device in use. In our example, that is the cable box. When the desired combination of devices appears, press the **Set Button 17**.

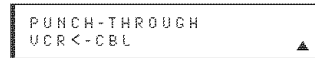


Figure 66

6. When the Set button is pressed, the display will change to show you that the new combination of control commands is being saved to the unit's memory, as shown in Figure 67. The word **SAVED** will flash four times and then the remote will return to normal operation.

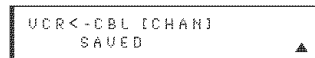


Figure 67

7. Once the punch-through is programmed, the **Channel Up/Down Buttons** of the second device named will be used when those buttons **35** are pressed while the master device is in use.

Returning the Channel Control Settings to Default Operation

If you wish to remove the Channel Punch-Through so that the commands for Channel Up/Down are returned to the factory default setting, follow the steps shown above, except that in Steps 4 and 5, select the same device for both the **DEVICE IN USE** on the left side of the bottom line and the **PUNCH-THROUGH** device. In the example used, the display to return the remote to default settings will appear as shown in Figure 68.

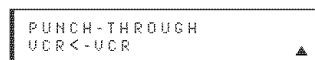


Figure 68

Transport Punch-Through

The **Play 36**, **Stop 20**, **Fast Forward/Reverse 19**, **Pause 20**, **Record 20** and **Skip Up/Down 21** Transport Controls are set at the factory to operate your DVD player, or the controls of a specific device such as a VCR or CD player when they are selected. However, by using the Transport Punch-Through feature you may program these controls to

transmit the commands for a different device. For example, you may wish to operate the transport of a second VCR connected to the VID 2/TV input, as shown in the following example.

1. Press and hold the **Program Button 25** for about three seconds while the message shown in Figure 24 appears in the remote's **LCD Information Display 3**. Release the button when the light under the **Set Button 17** turns red.
2. The remote's **MAIN MENU** message (Fig. 25), will appear in the LCD display and the **Set Button 17** will remain illuminated in red. Press the **▲/▼ Navigation Button 15** until **PUNCH-THROUGH** appears on the bottom line of the LCD screen, as shown in Figure 53. Press the **Set Button 17** to enter the main punch-through menu branch.
3. At the next menu screen, press the **▲/▼ Navigation Button 15** until **TRANSPORT** appears on the bottom line of the LCD screen, as shown in Figure 69. Press the **Set Button 17** to begin programming the remote for transport punch-through.

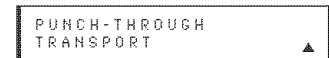


Figure 69

4. The next display screen (Figure 70) selects the device that will receive the punch-through commands. In our example, that is the TV button, as that is where we want the VCR's transport controls to be active. Press the **▲/▼ Navigation Button 15** until the name of the base device appears and then press the **Set Button 17**.

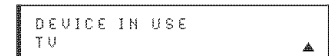


Figure 70

5. At the next display screen (Figure 71), select the device whose transport commands will be used. Press the **▲/▼ Navigation Button 15** until the desired device name appears to the right of the device in use. In our example, that is the VCR. When the desired combination of devices appears, press the **Set Button 17**.

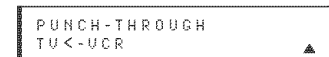


Figure 71

6. When the Set button is pressed, the display will change to show you that the new combination of control commands is being saved to the unit's memory, as shown in Figure 72. The word **SAVED** will flash four times and then the remote will return to normal operation.

CONFIGURING THE REMOTE

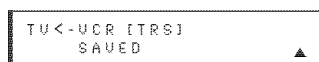


Figure 72

- Once the punch-through is programmed, the transport buttons of the second device named will be used when those buttons are pressed while the master device is in use.

Returning the Transport Control Settings to Default Operation

If you wish to remove the Transport Punch-Through so that the transport commands are returned to the factory default setting, follow the steps shown above, except that in Steps 4 and 5, select the same device for both the **DEVICE IN USE** on the left side of the bottom line and the **PUNCH-THROUGH** device. In the example used, the display to return the remote to default settings will appear as shown in Figure 73.

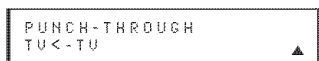


Figure 73

Renaming

While the names given to the buttons and inputs on the remote represent recognizable categories of audio/video products, system operation may be easier if the displays shown in the remote's LCD screen are customized to reflect the specific characteristics of a playback source's brand name or the new function given to a specific button when one remote's controls are programmed into the AVR remote. The AVR remote allows you to change the name of either a master device or any button on the remote using the following steps.

Renaming a Device

To rename a specific device/input source button, follow these steps. For this example, we will show you how to rename the Device/Input Selector normally shown as "TV" to "HDTV TUNER."

- Press and hold the **Program Button** **25** for about three seconds while the message shown in Figure 24 appears in the remote's **LCD Information Display** **3**. Release the button when the red light under the **Set Button** **17** appears.
- The remote's **MAIN MENU** message (Figure 25), will appear in the LCD display and the **Set Button** **17** will remain illuminated in red. Press the **▲/▼ Navigation Button** **15** until **RENAME** appears on the bottom line of the LCD screen, as shown in Figure 74.

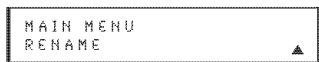


Figure 74

- At the next menu screen press the **▲/▼ Navigation Button** **15** until **RENAME DEVICE** appears on the bottom line of the LCD screen, as shown in Figure 75. Press the **Set Button** **17** to begin renaming a device.

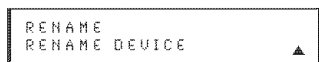


Figure 75

- The next display screen (Figure 76) is where you select the device that will be renamed. In our example, that is the TV button. Press the **▲/▼ Navigation Button** **15** until the name of the base device appears and then press the **Set Button** **17**.

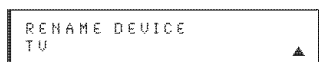


Figure 76

- At the next menu screen you will see the device name on the bottom line of the display with a blinking cursor box to the right of the device name. Press the **◀ Navigation Button** **15** to return the blinking cursor to the far left side of the display line. You may then retitle the device name as shown in the next step.
- To enter the new name, press the **Numeric Keys** **11**. The letters above the numbered buttons indicate which letter or symbol will appear when the button is pressed during the renaming process. The first press of the button will enter the first letter shown, subsequent presses of the same button will change the display to the other letters above that numbered key. For example, since the first letter we need to rename the input to HDTV Tuner is an "H", you would locate the "H" above the "4" button, and press the button twice. The first press shows a "G," the second press changes it to an "H." Consult the table at the end of this section to see which characters pressing a particular button generates.
- After you enter the first letter of the new device name, there are three options for entering the next character:

- To enter a letter that requires a different numeric key to be pressed, simply press that button. The cursor will automatically move to the next position and the first letter accessed by the new button will appear. Following our example, the next letter needed is a "D," so you would press the "3" button once.
- To enter a letter that uses the same numeric key, you must first press the **▶ Navigation Button** **15** to move the blinking cursor block

to the next position. Then press the **Numeric Key** **11** as required to enter the desired letter.

- To enter a blank space, press the **▶ Navigation Button** **15** twice. The first press will move the cursor to the right, and the second press will move the cursor one more space to the right, leaving a blank space between the last letter and the next one.

- Repeat Step 7 as needed to enter all the needed letters, numbers, characters and spaces.

- When the text entry is complete, press the **Set Button** **17**. The LCD display will blink **DEVICE RENAMED** three times and then return to normal operation.

Once a device is renamed you will see the new name on the top line of the remote's LCD display whenever the **Input//Device Selector** **4** is pressed, or when any other command/function button on the remote is pressed after the main Device Selector is pressed. Note that renaming a device in the remote will *not* change the name of the input used by the on-screen menu system of the AVR 435.

NOTES ON RENAMING DEVICES:

- To move the cursor to the right or left of the display during the renaming process, press the **◀/▶ Navigation Buttons** **15** as required.
- The table below shows the letters, numbers and characters that may be accessed by pressing the Numeric Keys:

Key	Characters	Key	Characters
1	[,],1	6	M,N,O,6
2	A,B,C,2	7	P,Q,R,S,7
3	D,E,F,3	8	T,U,V,8
4	G,H,I,4	9	W,X,Y,Z,9
5	J,K,L,5	0	-,.,#,0

Renaming Individual Keys

Thanks to the programming flexibility of the AVR remote, an individual button on the remote may be assigned a feature or function that is different from the name that appears as the factory default when the button is pressed. However, with the Rename Key function it is possible to rename almost any button on the remote so that when the button is pressed you will see a more descriptive or appropriate name displayed.

To rename a specific button on the remote, follow these steps. For this example, we will show you how to

rename the **DSP Surround Mode Selector** 7, which is normally not used when DVD is selected, so that it reads **ZOOM** in the remote's display.

1. Press and hold the **Program Button** 25 for about three seconds while the message shown in Figure 24 appears in the remote's **LCD Information Display** 3. Release the button when the red light under the **Set Button** 17 appears.
2. The remote's **MAIN MENU** message (Figure 25), will appear in the LCD display and the **Set Button** 17 will remain illuminated in red. Press the **▲/▼ Navigation Button** 15 until **RENAME** appears on the bottom line of the LCD screen, as shown in Figure 74.
3. At the next menu screen press the **▲/▼ Navigation Button** 15 until **RENAME KEY** appears on the bottom line of the LCD screen, as shown in Figure 77. Press the **Set Button** 17 to continue.

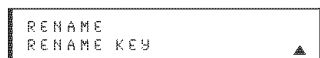


Figure 77

4. The next display screen (Figure 78) selects the device within which the key to be renamed exists. Press the **▲/▼ Navigation Buttons** 15 until the name of the base device appears. In our example, since we want to rename a button within the DVD device memory, **DVD** should appear in the lower line of the LCD. When the desired device name appears, press the **Set Button** 17.

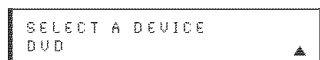


Figure 78

5. At the next menu screen, select the first button within the device to be renamed, as instructed in the display shown in Figure 79. Select the button by simply pressing it on the remote.

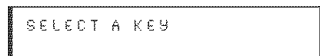


Figure 79

6. Depending on whether or not the button pressed already has a named function within the device selected, one of two things will happen.
 - a. If the button to be renamed already has a pre-programmed, or previously renamed title in the remote's memory, you will see that name on the top line of the LCD display, and a blinking block cursor will appear on the far left side of the bottom line of the display, as shown in Figure 80.



Figure 80

- b. If the button to be renamed does not have a function in the device selected, the top line of the LCD screen will be blank, and a blinking block cursor will appear on the far left side of the bottom line of the display, as shown in Figure 81.

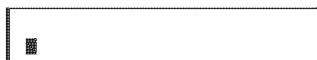


Figure 81

7. To enter the new name for the key, press the **Numeric Keys** 11. The letters above the numbered buttons indicate which letters or symbols will appear when the button is pressed during the renaming process. The first press of the button will enter the first character shown, subsequent presses will change the display to the other letters above that numbered key. For example, since the first letter we need to rename the Tone button to Zoom is a "Z," so you would locate the "Z" above the "9" button, and press the button four times. The first press shows a "W," the subsequent presses step through the other letters available until the "Z" appears. Consult the table on page 50 to see which characters are available by pressing a particular button.

8. After you enter the first letter of the new device name, there are three options for entering the next character:
 - a. To enter a letter that requires a different numeric key to be pressed, simply press that button. The cursor will automatically move to the next position and the first letter accessed by the new button will appear. Following our example, the next letter needed is an "O," so you would press the "6" button once.

- b. To enter a letter that uses the same numeric key, you must first press the **► Navigation Button** 15 to move the blinking cursor block to the next position. Then press the **Numeric Key** 11 as required to enter the desired letter. This is the way you would enter the second "O" in the word ZOOM, and again for the letter "M."

- c. To enter a blank space, press the **► Navigation Button** 15 twice. The first press will move the cursor to the right, and the second press will move the cursor one more space to the right, leaving a blank space between the last letter and the next one.

9. Repeat Steps 7 and 8 as needed to complete entering the needed letters, numbers, characters and spaces.

10. When the text entry is complete, press the **Set Button** 17. The new name will be entered into the remote's memory, replacing the default name.

11. At this point you have two options:
 - a. If you wish to program an additional key within the same device, press the **Set Button** 17 as instructed by the bottom line of the LCD display reading **ANOTHER KEY**. The remote will return to the **SELECT A KEY** menu option as shown in Step 6. Repeat the instructions in Steps 6 through 11 to rename the next key.

- b. If you have no additional keys to rename, press the **▲ Navigation Button** 15 once so that the menu screen displays **EXIT** on the bottom line of the display. Press the **Set Button** 17 to return the remote to normal operation.

NOTES ON RENAMING KEYS:

- Renaming a key does not change its function. You may change the function of an individual key by learning a new code into the remote. See page 44 for more information.
- When a key is renamed it will only apply to the specific device selected in Step 4. The same key may be renamed as needed for each individual device with which it is used.

Resetting the Remote

Depending on the way in which the remote has been programmed, there may be a situation where you wish to totally erase all changes that have been made to the remote and return it to the factory defaults. You may do that by following the steps shown below, but remember that once the remote is reset, ALL changes that have been made, including programming for use with other devices, learned keys, macros, punch-through settings and key names, will be erased and any settings you had previously made will have to be reentered.

To erase all settings and reset the remote to the original factory default settings and displays, follow these steps:

1. Press and hold the **Program Button** 25 for about three seconds while the message shown in Figure 24 appears in the remote's **LCD Information Display** 3. Release the button when the red light under the **Set Button** 17 appears.

2. The remote's **MAIN MENU** message (Fig. 25), will appear in the LCD display and the **Set Button** 17

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will remain illuminated in red. Press the ▲/▼ **Navigation Button 15** until **USER RESET** appears on the bottom line of the LCD screen, as shown in Figure 82.

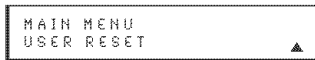


Figure 82

3. Press the **Set Button 17** to reset the remote. Note that once the Set Button is pressed the process may not be stopped. While the remote's memory is being cleared, a **RESETTING...** message will appear in the upper line of the remote's LCD screen as shown in Figure 83. It may take a few minutes for the reset process to take place, and the length of time will vary depending on how much customization and programming has taken place. Please be patient; as long as the message appears in the display the remote is functioning properly.

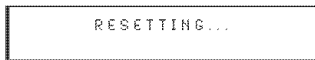


Figure 83

4. When the remote has been totally reset and returned to the factory default condition, a **REMOTE RESET COMPLETE** message will appear (Figure 84) briefly, and then the remote will return to normal operation.

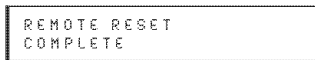


Figure 84

Device Priority Timing

The remote's Device Priority mode allows you to select the length of time that the remote continues to issue codes for a device other than the AVR once you use the remote to control a source or other product. The default operation for the remote is to have all buttons on the remote return to their AVR functions 5 seconds after the last button press. However, you may program the AVR remote to remain active as the source device remote for 12 seconds, or to keep the source device's codes active until another **Input Selector 4** is pressed. If you wish to keep the default setting of a 5-second return, no changes are needed.

To change the device priority timing, follow these steps:

1. Press and hold the **Program Button 25** for about 3 seconds while the message shown in Figure 24 appears in the remote's **LCD Information Display 3**. Release the button when the red light under the **Set Button 17** appears.

2. The remote's **MAIN MENU** message (Fig. 25) will appear in the LCD display and the **Set Button 17** will remain illuminated in red. Press the ▲/▼ **Navigation Buttons 15** until **DEVICE PRIORITY** appears in the bottom line of the LCD screen, as shown in Figure 86, and press the **Set Button 17**.

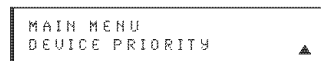


Figure 86

3. When the **DEVICE PRIORITY** message appears in the remote's LCD display (Figure 87), press the ▲/▼ **Navigation Buttons 15** to select the option that best suits your needs.

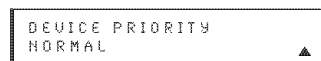


Figure 87

- When **NORMAL** appears on the bottom line of the LCD, the AVR remote will revert to AVR control 5 seconds after the last button press, when you are controlling a source device.
 - When **EXTENDED** appears on the bottom line of the LCD, the AVR remote will revert to AVR control 12 seconds after the last button press, when you are controlling a source device.
 - When **LAST USED** appears on the bottom line of the LCD, once you press one of the **Input Selectors 4**, the AVR remote will continue to operate as with the codes for the selected source device, until another device is selected. If you choose this option, please remember that you will have to press the **AVR Selector 5** in order to use the remote to operate the AVR for functions such as surround mode selection, but the Volume and Mute controls will continue to remain active in their AVR modes at all times.
4. Press the **Set Button 17** one more time. The LCD display will show the word **SAVING** on the top line for about 2 seconds and then flash **SAVED** four times on the bottom line to indicate that the setting has been accepted by the remote's memory.

Backlight Options

The AVR 435's remote has a built-in backlight system that makes it easier to use the remote when the room lighting is dimmed for an optimal home theater experience. To turn the backlighting on, simply press the **Light Button 26**. That button is made from a special "glow" material that makes it easier to find in dark rooms. This glow feature does not use any battery power, so the glow will fade when the remote is kept

in a dark room for an extended period of time. You may "recharge" it by placing the remote in normal room lighting for a few hours.

Once the **Light Button 25** is pressed, the remote's backlighting will remain on for approximately 7 seconds, and when you press any button on the remote while the backlighting is on, the light will stay on for another 7 seconds. However, the remote's "Couch" function will conserve battery power by turning both the backlighting and the LCD display off when any button is pressed for more than 30 seconds.

You may also configure the remote so that the backlighting will come on, any time a button is pressed. To set this option, follow these steps:

1. Press and hold the **Program Button 25** for about 3 seconds while the message shown in Figure 24 appears in the remote's LCD display. Release the button when the red light under the **Set Button 17** appears.
2. When the remote's Main Menu message (Fig. 25) appears in the LCD display and the **Set Button 17** remains illuminated in red, press the ▲/▼ **Navigation Button 15** until **BACK LIGHT** appears in the bottom line of the LCD screen, as shown in Figure 88.

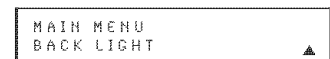


Figure 88

3. Press the **Set Button 17** and then press the ▲/▼ **Navigation Buttons 15** again so that **ON FULL** appears in the bottom line of the LCD display, as shown in Figure 89.

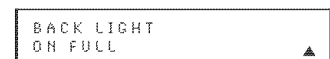


Figure 89

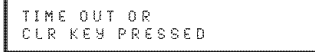
4. Press the **Set Button 17** one more time. The LCD display will show the word **SAVING** on the top line for about 2 seconds and then flash **SAVED** four times on the bottom line to indicate that the setting has been accepted by the remote's memory.
5. The remote's backlighting will now turn on whenever a button is pressed. To revert to the original setting, follow the four steps shown above, but in Step 3, select the option that has the word **NORMAL** on the bottom line of the LCD display.

Additional Notes on Configuring and Operating the Remote

- When the remote is being programmed, it will automatically time-out if no button is pressed within a

CONFIGURING THE REMOTE

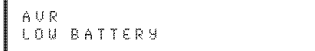
30-second period. The message shown in Figure 90 will appear briefly, and the remote will then exit the feature being programmed and any data entered will be lost.



TIME OUT OR
CLR KEY PRESSED

Figure 90


- The programming or configuration process may also be stopped at any time by pressing the **Clear Button** **(10)**. The message shown in Figure 90 will appear, the data entered in the current process will be lost and the remote will return to normal operation. Any process that was underway when the button will be pressed must be restarted.
- Extensive use of the programming, learning and configuration functions of the remote may consume significantly more battery power than normal remote operation. While the batteries should last for four to six months in normal operation, you may find that they need to be changed sooner after the remote is programmed for the first time.
- When the batteries approach a level below which the remote will not function, the remote's LCD screen will display a **LOW BATTERY** warning, as shown in Figure 91. We strongly recommend replacing the batteries as soon as this message appears to avoid the loss of programming and configuration settings. These settings are *not* lost when the batteries are changed quickly.



AUR
LOW BATTERY

Figure 91

TROUBLESHOOTING GUIDE

SYMPTOM	CAUSE	SOLUTION
Unit does not function when Main Power Switch is pushed	<ul style="list-style-type: none"> No AC Power 	<ul style="list-style-type: none"> Make certain AC power cord is plugged into a live outlet Check to see whether outlet is switch-controlled
Display lights, but no sound or picture	<ul style="list-style-type: none"> Intermittent input connections Mute is on Volume control is down 	<ul style="list-style-type: none"> Make certain that all input and speaker connections are secure Press Mute Button  Turn up volume control
Unit turns on, but front-panel display does not light up	<ul style="list-style-type: none"> Display brightness is turned off 	<ul style="list-style-type: none"> Follow the instructions in the Display Brightness section on page 38 or 39 so that the display is set to VFD FULL
No sound from any speaker; light around power switch is red	<ul style="list-style-type: none"> Amplifier is in protection mode due to possible short Amplifier is in protection mode due to internal problems 	<ul style="list-style-type: none"> Check speaker wire connections for shorts at receiver and speaker ends Contact your local Harman Kardon service center
No sound from surround or center speakers	<ul style="list-style-type: none"> Incorrect surround mode Input is monaural Incorrect configuration Stereo or Mono program material 	<ul style="list-style-type: none"> Select a mode other than Stereo There is no surround information from mono sources Check speaker mode configuration The surround decoder may not create center- or rear-channel information from non-encoded programs
Unit does not respond to remote commands	<ul style="list-style-type: none"> Weak batteries in remote Wrong device selected Remote sensor is obscured 	<ul style="list-style-type: none"> Change remote batteries Press the AVR selector Make certain front-panel sensor is visible to remote or connect remote sensor
Intermittent buzzing in tuner	<ul style="list-style-type: none"> Local interference 	<ul style="list-style-type: none"> Move unit or antenna away from computers, fluorescent lights, motors or other electrical appliances
Letters flash in the channel indicator display and digital audio stops	<ul style="list-style-type: none"> Digital audio feed paused 	<ul style="list-style-type: none"> Resume play for DVD Check that Digital Input is selected
Fan does not appear to operate	<ul style="list-style-type: none"> Additional cooling may not be required 	<ul style="list-style-type: none"> The fan is activated only when additional cooling is required due to high internal temperature. It is normal for the fan to be inactive at normal volume levels.

In addition to the items shown above, additional information on troubleshooting possible problems with your AVR 435, or installation-related issues, may be found in the list of "Frequently Asked Questions" which is located in the Product Support section of our Web site at www.harmankardon.com.

Processor Reset

In the rare case where the unit's operation or the displays seem abnormal, the cause may involve the erratic operation of the system's memory or microprocessor.

To correct this problem, first unplug the unit from the AC wall outlet and wait at least 3 minutes. After the pause, reconnect the AC power cord and check the unit's operation. If the system still malfunctions, a system reset may clear the problem.

To clear the AVR 435's entire system memory including tuner presets, output level settings, delay times and

speaker configuration data, first put the unit in Standby by pressing the **Standby/On Switch** **1**. Next, press and hold the **Surround Mode Group Selector** **2** and the **Tuning Mode Selector** **8** buttons for three seconds.

The unit will turn on automatically and display the **RESET** message in the **Upper Display Line** **13**.

NOTE: Resetting the processor will erase any configuration settings you have made for speakers, output levels, surround modes, digital input assignments as well as the tuner presets. After a reset the unit will be

returned to the factory presets, and all settings for these items must be reentered.

If the system is still operating incorrectly, there may have been an electronic discharge or severe AC line interference that has corrupted the memory or microprocessor.

If these steps do not solve the problem, consult an authorized Harman Kardon service center.

AVR 435 TECHNICAL SPECIFICATIONS

Audio Section

Stereo Mode

Continuous Average Power (FTC)

80 Watts per channel, 20Hz–20kHz,
@ <0.07% THD, both channels driven into 8 ohms

Seven-Channel Surround Modes

Power per Individual Channel

Front L&R channels:
65 Watts per channel
@ <0.07% THD, 20Hz–20kHz into 8 ohms

Center channel:
65 Watts @ <0.07% THD, 20Hz–20kHz into 8 ohms

Surround (L & R Side, L & R back) channels:
65 Watts per channel
@ <0.07% THD, 20Hz–20kHz into 8 ohms

Input Sensitivity/Impedance

Linear (High-Level) 200mV/47k ohms

Signal-to-Noise Ratio (IHF-A) 100dB

Surround System Adjacent Channel Separation

Pro Logic V/II 40dB

Dolby Digital (AC-3) 55dB

DTS 55dB

Frequency Response

@ 1W (+0dB, -3dB) 10Hz – 130kHz

High Instantaneous

Current Capability (HCC) ±40 Amps

Transient Intermodulation

Distortion (TIM) Unmeasurable

Slew Rate

40V/μsec

FM Tuner Section

Frequency Range 87.5–108.0MHz

Usable Sensitivity IHF 1.3μV/13.2dBf

Signal-to-Noise Ratio Mono/Stereo 70/68dB

Distortion Mono/Stereo 0.2/0.3%

Stereo Separation 40dB @ 1kHz

Selectivity ±400kHz, 70dB

Image Rejection 80dB

IF Rejection 90dB

AM Tuner Section

Frequency Range 520–1720kHz

Signal-to-Noise Ratio 45dB

Usable Sensitivity Loop 500μV

Distortion 1kHz, 50% Mod 0.8%

Selectivity ±10kHz, 30dB

Video Section

Television Format NTSC

Input Level/Impedance 1Vp-p/75 ohms

Output Level/Impedance 1Vp-p/75 ohms

Video Frequency Response
(Composite and S-Video) 10Hz–8MHz (-3dB)

Video Frequency Response
(Component Video) 10Hz–50MHz (-3dB)

General

Power Requirement AC 120V/60Hz

Power Consumption 59W at Power On, idle; 1,000W at rated power output
(7 channels driven)

Dimensions

Width Product 17.3 inches (440mm) Shipping 20.1 inches (510mm)

Height 6.5 inches (165mm) 10 inches (254mm)

Depth 17.1 inches (435mm) 22.2 inches (565mm)

Weight 39 lb (18.6kg) 45 lb (21.4kg)

Depth measurement includes knobs, buttons and terminal connections.

Height measurement includes feet and chassis.

All features and specifications are subject to change without notice.

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Supplied Accessories

The following accessory items are supplied with the AVR 435. If any of these items are missing, please contact Harman Kardon customer service at www.harmankardon.com.

- A system remote control
- A Zone II remote control
- An **III** **Set/EQ** microphone
- Extender rod for microphone
- An AM loop antenna
- An FM wire antenna
- Six AAA batteries

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