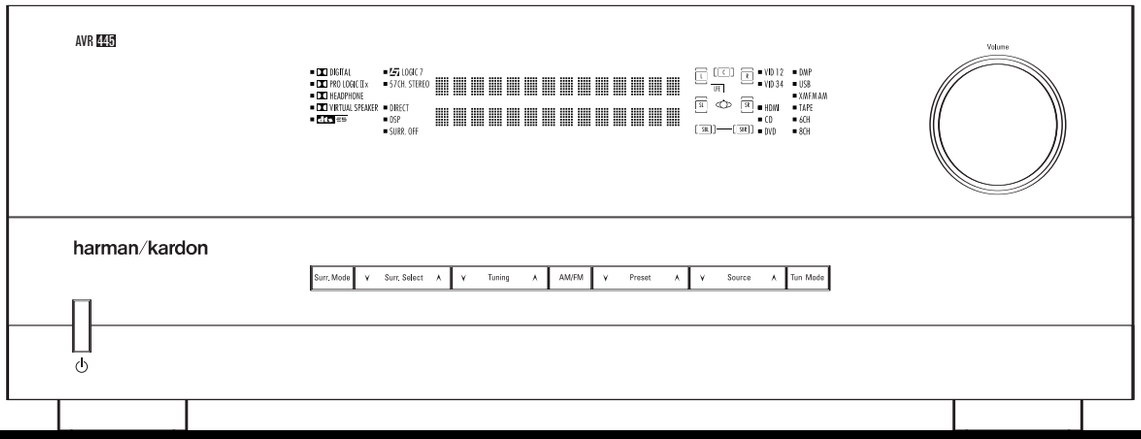
harman/kardon®

Designed to Entertain.™

AVR 445

AUDIO/VIDEO RECEIVER
OWNER'S MANUAL



AVR 445 AUDIO/VIDEO RECEIVER

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CAUTION

RISK OF ELECTRIC SHOCK DO NOT OPEN

CAUTION: To prevent electric shock, do not use this (polarized) plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

For Canadian model

This class B digital apparatus complies with Canadian ICES-003.
For models having a power cord with a polarized plug: CAUTION: To prevent electric shock, match wide blade of plug to wide slot, fully insert.

Modèle pour les Canadien

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.
Sur les modèles dont la fiche est polarisee:
ATTENTION: Pour éviter les chocs électriques, introduire la lame la plus large de la fiche dans la borne correspondante de la prise et pousser jusqu'au fond.

Please register your product on our Web site at www.harmankardon.com. Note: You'll need the serial number of your new AVR. At the same time, you can choose to be notified about our new products and/or special promotions.

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

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 main remote control

A – (letter in an oval) indicates a button on the ZR 10 remote control

Important note about the instructions in this manual: The appearance of the menus, text and/or cursor in 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.

INTRODUCTION

Thank you for choosing Harman Kardon! With the purchase of a Harman Kardon® AVR 445, you are about to begin many years of listening enjoyment.

The AVR 445 has the most extensive range of audio and video processing, control and connectivity options ever offered by Harman Kardon, enabling it to provide the best possible audio and video reproduction with any type of source material. Teaming advanced processing circuitry with proprietary technologies such as EzSet/EQ, the AVR 445 seamlessly integrates every component in your entertainment system to deliver the best possible sound and images.

Some of the leading-edge features that are available with the AVR 445, such as HDMI™ switching and XM Ready® operation, are new to even the most experienced home theater enthusiast. Although the power of the AVR 445 makes them easy to use, we strongly recommend that you take a few minutes to read this owner's manual to familiarize yourself with how the full suite of AVR 445 features and capabilities are configured and used in day-to-day operation. This small investment of time will yield significant dividends in taking the maximum advantage of this new addition to your home theater system.

If you have any questions about this product, its installation or its operation, you may also access a wealth of information and assistance by visiting our Web site at www.harmankardon.com.

Description and Features

The AVR 445 serves as the hub of your home entertainment system, providing a wide range of listening possibilities for almost any audio or video program source, whether it is the broadcast of a movie or sporting event in HDTV or a vintage mono or stereo recording. When playing digital audio sources, the AVR 445 decodes Dolby® Digital, Dolby Digital EX, DTS® and DTS-ES® data streams. Two-channel stereo and matrix surround sources benefit from all current Dolby Pro Logic® IIx modes and DTS Neo:6.® The latest version of our proprietary Logic 7® process is on-board to create a wider, more enveloping sound field and more defined surround channel positioning, regardless of the type of source material. Additional audio playback options include a direct connection to compatible computer-based sources through a direct USB connection.

The AVR 445 takes the "video" part of its name seriously. Along with two HDMI inputs and three 60MHz analog component video inputs, the AVR 445 converts composite and S-video to component for single video connections. The AVR 445 also provides A/V sync delay so that lip sync errors – commonly seen when digital video processing is used in a source, program or video display – are eliminated.

Thanks to a wide range of multizone options and a standard ZR 10 remote control, the AVR 445 makes it possible to watch and listen to a separate source in one room while the main home theater uses a different source. Using the assignable rear surround channel amplifiers, you may create a basic remote listening zone without any additional equipment, or the unit's multiroom outputs may be used to feed an optional, external power amplifier and volume control. For one-wire multiroom connectivity, the AVR 445 is A-BUS/*READY*®, requiring only a single Category 5/5e cable run and an optional remote module to power a pair of remote speakers while controlling volume and enabling full control over the program source and connected IR-controlled devices.

Along with the latest advances in digital audio and video technology, Harman Kardon recognizes that some things remain constant, and in the case of the AVR 445 that is a requirement for audio power best served by our time-honored high-current, ultrawide-bandwidth amplifier design. The AVR 445's seven-channel amplifier provides the power to reproduce the loudest crescendos or cinema sound effects while remaining virtually free from distortion or system noise.

With a combination of 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 445 represents the culmination of Harman Kardon's fifty-plus-year history of delivering the finest sonic performance.

- All popular digital and matrix surround modes, including Dolby® Digital, Dolby Digital EX, Dolby Pro Logic® II, 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
- Two HDMI™ inputs and three assignable high-bandwidth analog component inputs for switching the latest high-definition video sources
- Converts composite and S-video sources to component video
- EzSet/EQ for quick and accurate system setup and room correction
- Harman Kardon's Logic 7® processing brings a new sense of reality to stereo and matrix surround sources
- Dolby Virtual Speaker processing for use when less than a full 5.1 or 7.1 speaker complement is available
- Dolby Headphone for spacious, open sound when using headphones
- USB connectivity for audio playback with compatible computers and quick system upgrades
- Full bass management for all inputs, including the analog direct inputs for high-resolution DVDs, DVD-Audio and SACD™ players, including Quad Crossover settings and individual settings for each input
- A/V sync delay adjustable for each video input delivers perfect lip sync with digital programs or video displays
- Front-panel analog audio/video jacks may be used as either inputs or outputs for connection to the latest portable products or video game consoles
- Extensive multiroom options, including a standard ZR 10 remote, audio and video outputs to the remote zone, 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 445 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 445 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 interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept interference received, including interference that may cause undesired operation.

NOTE: Changes or modifications may cause this unit to fail to comply with Part 15 of the FCC rules and may void the user's authority to operate the equipment.

Unpacking

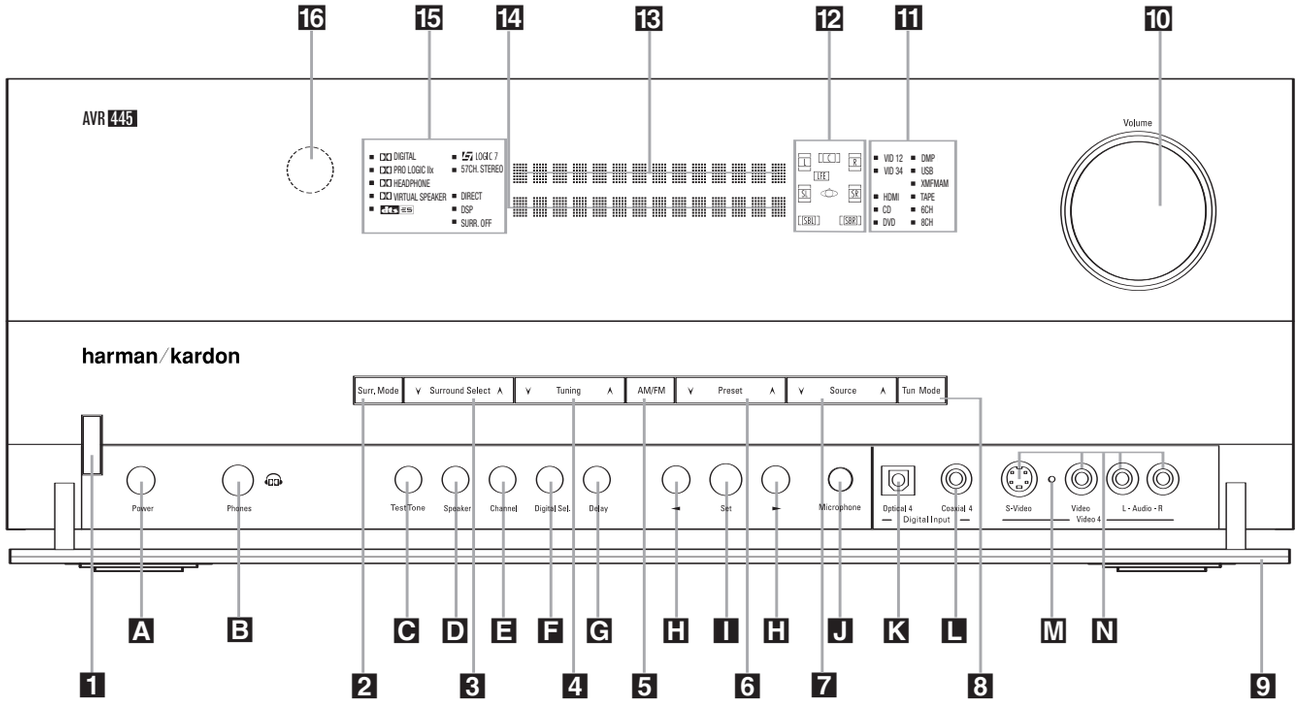
The carton and shipping materials used to protect your new receiver during shipment were specially designed to cushion it from shock and vibration. We suggest that you save the carton and packing materials for use in shipping if you move, or should the unit ever need repair.

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 445's front panel:

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

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 toward you.

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

1 Standby/On Switch: When the **Main Power Switch A** is "ON," press this button to turn on the AVR 445; press it again to turn the unit off. Note that the illumination surrounding the switch will turn blue when the unit is on, or in the Multiroom mode.

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 pages 24, 35 and 58.

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 signal strong enough 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 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 39 for more information on using the tuner. When an XM Ready module is connected and activated, and when there is sufficient signal strength for the XM system to operate, pressing this button will also change the XM Radio channel.

5 Tuner Band Selector: Pressing this button will automatically switch the AVR 445 to the Tuner mode. Pressing it again will select the AM or FM frequency band, or XM Radio. (See page 39 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 39 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 P** 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 P** will increase the frequency. (See page 39 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 pages 39 for more information on using the tuner.)

When an optional XM Connect & Play module is connected and activated, and when there is sufficient signal strength for the XM system to operate, this button has a different set of functions than when traditional AM or FM radio is in use. See page 39 for more information on XM Radio operation.

9 Front-Panel 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 toward 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 445 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 indicated by one 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. The letters inside each box display 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 38 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.

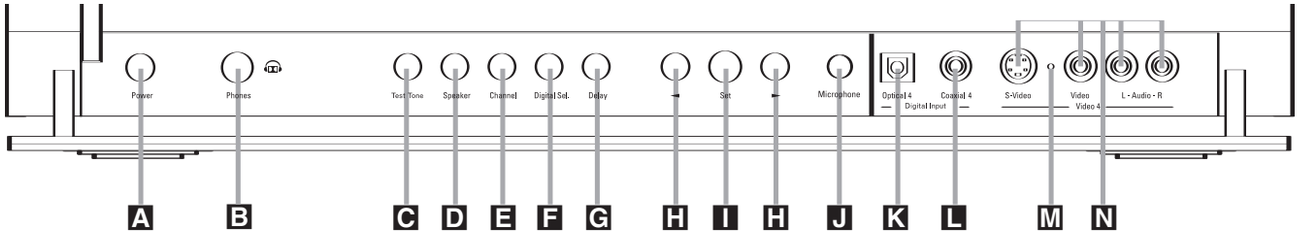
When an XM Connect & Play module is connected and activated, and when there is sufficient signal strength for the XM system to operate, the XM channel number and signal strength will appear here.

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. When an XM Ready module is connected and activated, and when there is sufficient signal strength for the XM system to operate, a variety of messages and information, including the XM channel title name, the current artist and track title, the XM Radio channel category and, when available, local traffic and weather information, will appear here.

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 36 for more information.)

16 Remote Sensor Window: The sensor behind this window receives infrared signals from the remote control. Aim the remote control 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 toward you.

A Main Power Switch: Press this switch to apply power to the AVR 445. 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 445'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 adapter, 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 the Dolby Headphone mode for an enhanced listening experience.

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 35 for more information on the tone controls.

D Speaker Selector Button: Press this button to begin the process of manually configuring the AVR 445 for the type of speakers it is being used with. For complete information on configuring the speaker settings, see page 29.

E Channel Adjust Selector: Press the button to begin the process of manually adjusting the channel level outputs using the source currently playing through your AVR. For complete information on adjusting the channel output level, see page 41.

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 35 for more information on digital audio.

G Delay Adjust Selector: Press this button to begin the process of adjusting the delay settings. See page 30 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.

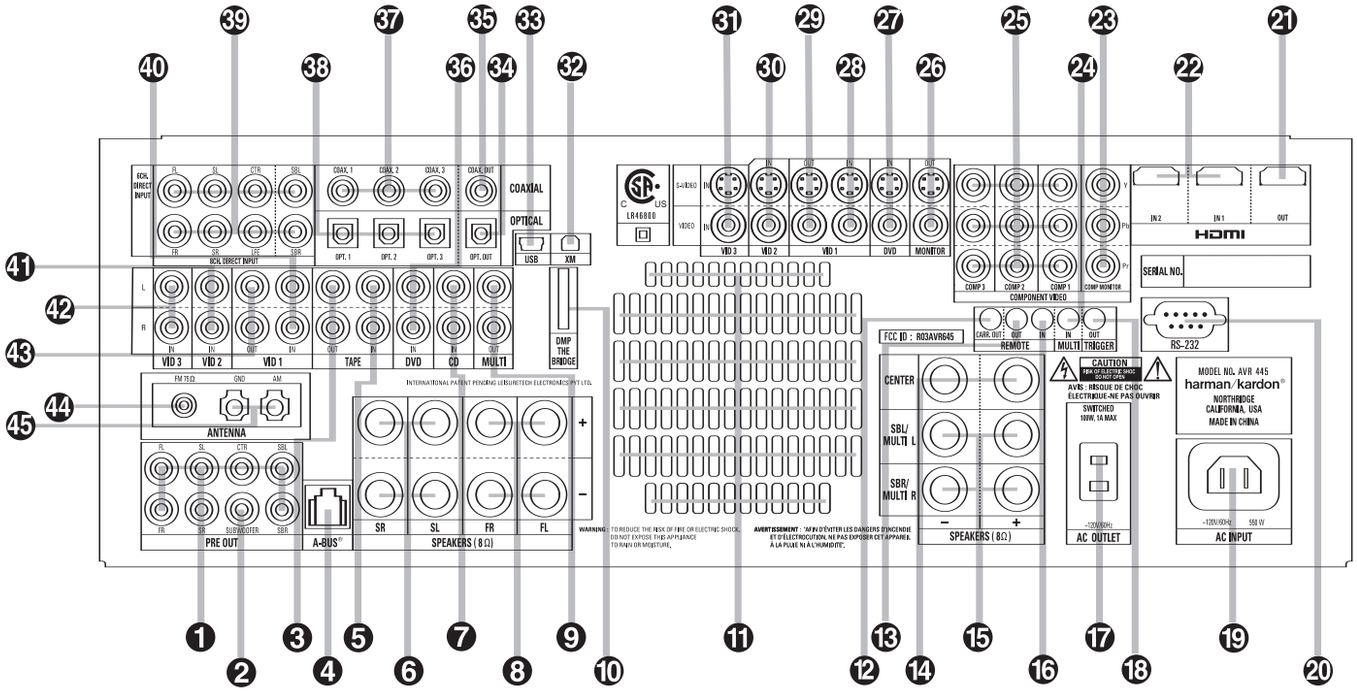
K Optical 4 Digital Input: Connect the optical digital output of an audio or video product to this jack.

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 Input/Output Status Indicator: This LED indicator will normally light green to show that the front-panel **Video 4 Input/Output Jacks N** are operating as inputs. When these jacks are configured for use as outputs, the indicator will turn red to show that the jack may be used as an output for recording. (See pages 22 and 40 for more information on configuring the front-panel jacks as outputs, rather than inputs.)

N Video 4 Input/Output Jacks: These audio/video jacks may be used as either inputs or outputs for temporary connection to video games or portable audio/video products such as camcorders and portable audio players. (See pages 22 and 40 for more information on switching these jacks between inputs and outputs.)

REAR-PANEL CONNECTIONS



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.

1. Preamp Outputs
2. Subwoofer Output
3. Tape Outputs
4. A-BUS Connector
5. Tape Inputs
6. Surround Speaker Outputs
7. CD Audio Input
8. Front Speaker Outputs
9. Multiroom Audio Outputs
10. The Bridge™ Digital Media Player (DMP) Input
11. Fan Vents
12. Full Carrier IR Output
13. IR Output
14. Center Channel Speaker Outputs
15. Surround Back/Multiroom Speaker Outputs
16. IR Input
17. Switched AC Accessory Outlet
18. Trigger Output
19. AC Power Cord Socket
20. RS-232 Port
21. HDMI Output
22. HDMI Inputs
23. Component Video Monitor Outputs
24. Multiroom IR Input
25. Component Video Inputs
26. Video Monitor Outputs
27. DVD Video Inputs
28. Video 1 Video Inputs
29. Video 1 Video Outputs
30. Video 2 Video Inputs
31. Video 3 Video Inputs
32. XM Ready Input
33. USB Connector
34. Optical Digital Audio Output
35. Coaxial Digital Audio Output
36. DVD Audio Inputs
37. Coaxial Digital Audio Inputs
38. Optical Digital Audio Inputs
39. 8-Channel Direct Inputs
40. Video 1 Audio Inputs
41. Video 2 Audio Inputs
42. Video 3 Audio Inputs
43. Video 1 Audio Outputs
44. FM Antenna Jack
45. AM Antenna Connections

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
Front Right:	Red
Center:	Green
Surround Left:	Blue
Surround Right:	Gray
Surround Back Left:	Brown
Surround Back Right:	Tan
Subwoofer:	Purple
Coaxial Digital Audio:	Orange
Composite Video:	Yellow
Component Video “Y”:	Green
Component Video “Pr”:	Red
Component Video “Pb”:	Blue
Optical Digital In:	Black
Optical Digital Out:	Gray

REAR-PANEL CONNECTIONS

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

❷ **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.

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

❹ **A-BUS Connector:** Connect this jack to optional A-BUS®-certified products to extend the multiroom capabilities of your AVR 445. See page 19 for more information on A-BUS.

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

❻ **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 17 for more information on speaker polarity.)

❼ **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.

❽ **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 445 to the red (+) terminals on the speakers and the black (–) terminals on the AVR 445 to the black (–) terminals on the speakers. See page 17 for more information on speaker polarity.

❾ **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.

❿ **The Bridge™ Digital Media Player (DMP) Input:** With the AVR 445 turned off, connect the optional Harman Kardon The Bridge™ to this connector. Once this is done and with a compatible iPod® (optional) docked in The Bridge, selecting the The Bridge/DMP input allows you to play audio from the iPod and view navigation menus on the AVR's front panel and any video display connected to the AVR. You may control the iPod's functions and select tracks using the ▲/▼/◀/▶ ⓮ Ⓖ, **Set** ⓰ Ⓠ and **Transport** ⓱ ⓳ ⓴ Ⓟ buttons. See page 39 for more information.

⓫ **Fan Vents:** These ventilation holes are the output of the AVR 445'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.

⓬ **Full Carrier IR Output:** The output of this jack is the full signal received at the **Remote Sensor Window** ⓰ or input through the **IR Input** ⓰ including the carrier frequency that is removed from signals at the **IR Output** ⓭. Use this output to extend IR signals to the input of compatible products either by direct connection or through the use of optional, external IR "blasters". If you are in doubt as to which of the 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.

⓭ **IR Output:** This connection permits the IR sensor in the receiver to serve remote controlled devices with "stripped carrier." Connect this jack to the "IR IN" jack on compatible Harman Kardon equipment.

⓮ **Center Channel 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 17 for more information on speaker polarity.)

⓯ **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 Multiroom menu of the OSD system. See page 44 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.

⓰ **IR Input:** If the AVR 445'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.

⓱ **Switched AC Accessory Outlet:** This outlet may be used to power any device you wish to have turned on when the AVR 445 is turned on with the **Standby/On Switch** ❶.

IMPORTANT NOTE: The power consumption of any device connected to the accessory outlet should not exceed 100 watts. Never connect high-power devices such as amplifiers or video displays to the accessory outlet.

⓲ **Trigger Output:** Connect this jack to the "Trigger In" jack of an optional external component such as an audio power amplifier that you want to be controlled to mirror the power state of the AVR 445. When this connection is used, the AVR 445 will automatically send a low-voltage signal to the connected device that turns it on when the AVR 445 is on, and off when the AVR 445 is placed in the Standby mode. The connected component must respond to a 6-volt presence as the control signal.

⓳ **AC Power Cord Socket:** Connect the AC power cord here 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.

⓴ **RS-232 Port:** This jack may be used to control the AVR 445 over a bidirectional 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 or installer.

㉑ **HDMI Output:** Connect this jack to the HDMI input on a compatible HDMI-equipped video display.

㉒ **HDMI Inputs:** Connect the HDMI output of video sources such as a DVD player, set-top box or HDTV tuner to either of these jacks.

㉓ **Component Video Monitor Outputs:** Connect these outputs to the component video inputs of a video display.

㉔ **Multiroom IR Input:** Connect the output of an IR sensor in a remote room to this jack to operate the AVR 445's multiroom control system.

㉕ **Component Video Inputs:** These inputs may be used with any source device that is equipped with analog component video outputs, as assigned through the IN/OUT SETUP menu. See page 23 for more information on configuring the component video inputs.

REAR-PANEL CONNECTIONS

㉖ **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.

㉗ **DVD Video Inputs:** Connect the composite or S-video outputs of a DVD player or other video source to these jacks.

㉘ **Video 1 Video Inputs:** Connect the composite or S-video PLAY/OUT jacks of a VCR or other video source to these jacks.

㉙ **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.

㉚ **Video 2 Video Inputs:** Connect the composite or S-video PLAY/OUT jacks of a VCR or other video source to these jacks.

㉛ **Video 3 Video Inputs:** Connect the composite or S-video PLAY/OUT jacks of a VCR or other video source to these jacks.

㉜ **XM Ready Input:** When an optional XM Connect & Play module is connected to this jack, and the XM service activated, you will be able to enjoy the XM Radio through your AVR 445. See page 39 for more information.

㉝ **USB Connector:** Connect a cable with a USB "Mini B" connector to the AVR and the other end to a compatible computer running Windows® 2000, Windows XP or higher with the latest service packs installed, to use this port to listen to audio from the computer through the AVR 445. This connection is also used to connect a compatible computer to the AVR for system upgrades, when available. See page 37 for more information on playback of computer audio with the AVR. Instructions for upgrades will accompany the upgrade file download package.

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

㊱ **DVD Audio Inputs:** Connect the left/right analog outputs of a DVD player or other audio source to these jacks.

㊲ **Coaxial Digital Audio Inputs:** Connect the coax digital output from a DVD player, HDTV receiver, 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.

㊳ **Optical Digital Audio Inputs:** Connect the optical digital output from a DVD player, HDTV receiver, 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 **8-Channel Direct Inputs:** These jacks are used for connection to source devices such as high-resolution DVD players, DVD-Audio or SACD players with discrete analog audio 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 5.1 audio signals.

㊵ **Video 1 Audio Inputs:** Connect the left/right PLAY/OUT audio output 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 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.

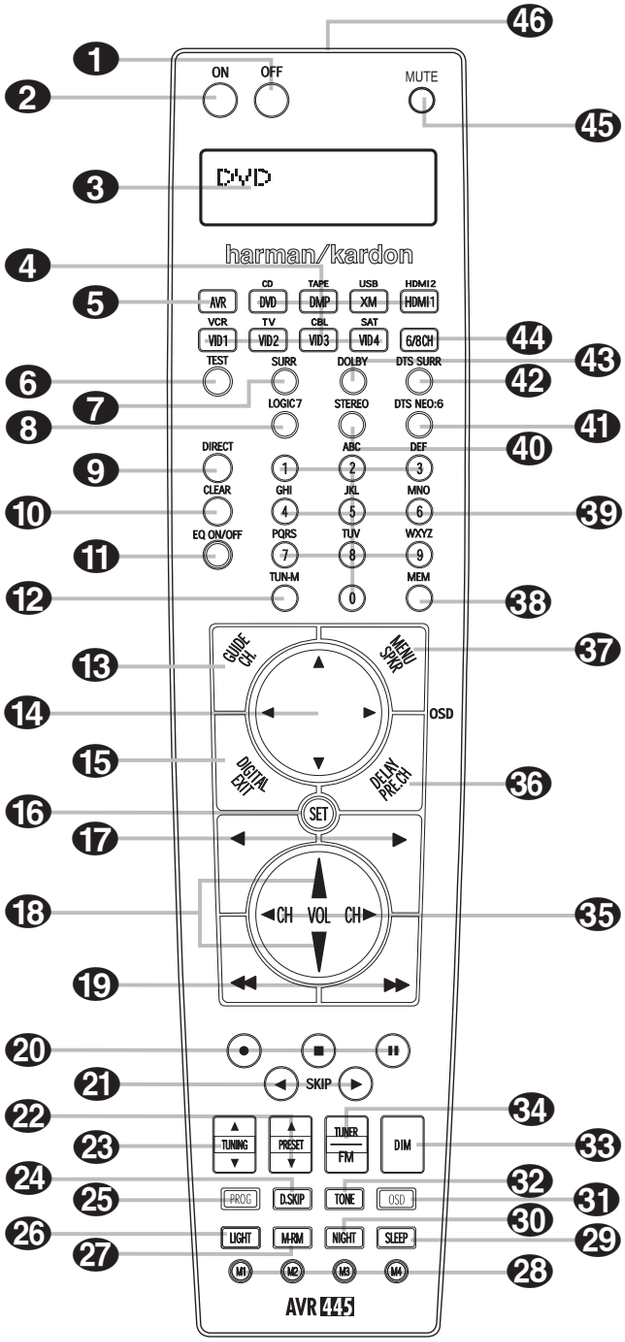
㊸ **Video 1 Audio Outputs:** Connect the left/right REC/IN audio input jacks on a VCR or other video source to these jacks.

㊹ **FM Antenna Jack:** Connect the supplied indoor or an optional external FM antenna to this terminal.

㊺ **AM Antenna Connections:** 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.

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. EzSet/EQ On/Off Button
12. Tuning Mode Button
13. Channel Select Button
14. Navigation Button
15. Digital Select Button
16. Set Button
17. Transport Play Buttons
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. Tuning Up/Down Button
24. Disc Skip Button
25. Program Button
26. Light Button
27. Multiroom Button
28. Macro Buttons
29. Sleep Button
30. Night Mode Button
31. OSD Button
32. Tone Control Button
33. Dim Button
34. Tuner/FM Select Button
35. Channel Up/Down Selector
36. Delay Select Button
37. Speaker Select Button
38. Memory Button
39. Numeric Keys
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-Channel/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 445. 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 445's remote may be programmed to control up to thirteen devices, including the AVR 445. Before using the remote, it is important to remember to press the **Input Selector Button** ❹ that corresponds to the unit you wish to operate. In addition, the AVR 445's remote is shipped from the factory to operate the AVR 445 and most Harman Kardon brand products. 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 46–49 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** ❹. The descriptions shown here primarily detail the functions of the remote when it is used to operate the AVR 445.

❶ **Power Off Button:** Press this button to place the AVR 445 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.

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

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

❹ **Input Selectors:** Pressing one of these buttons will perform three actions at the same time. First, if the AVR 445 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 445. Finally, it will change the remote control so that it controls the device selected.

The buttons labeled DVD, DMP, XM and HDMI 1 are each used to select either of two input sources:

- The first press of the DVD Button selects the component connected to the DVD inputs. A second press of this button selects the component connected to the CD inputs.
- The first press of the button labeled DMP selects The Bridge as the input. A second press of this button selects the device connected to the Tape inputs.
- The first press of the XM button selects XM Radio as the input. A second press selects the source connected to the USB jack as the input.
- The first press of the HDMI 1 button selects the device that is connected to the HDMI 1 jack. A second press selects the device connected to the HDMI 2 jack.

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** ❺, follow the instructions on page 55.

❺ **AVR Selector:** Pressing this button will switch the remote so that it will operate the AVR 445's functions. If the AVR 445 is in the Standby mode, it will also turn the AVR 445 on.

❻ **Test Button:** Press this button to begin the sequence used to manually calibrate the AVR 445's output levels. (See page 31 for more information on manually calibrating the AVR 445.)

❼ **DSP Surround Mode Selector:** Press this button to select one of the DSP surround modes, such as Hall 1, Hall 2 or Theater. Each press of the button selects another mode. (See page 58 for more information on surround modes.)

❽ **Logic 7 Mode Select Button:** Press this button to select from among the available Logic 7 surround modes. (See page 58 for available Logic 7 options.)

❾ **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** ㊴ to select a station. (See page 39 for more information on the tuner.)

❿ **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.

⓫ **EzSet/EQ Button:** Press this button to turn the filters used by EzSet/EQ on or off. This allows you to hear the difference in system performance when EzSet/EQ is engaged or out of the signal path.

⓬ **Tuning Mode Button:** When using listening to AM or FM stations, 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 ㉓ Ⓟ 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 ㉓ Ⓟ 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 39 for more information on AM/FM tuner operation.) When listing to XM Radio, press this button to scroll through the following display options for the **Lower Display Line** 14: Channel Name ➔ Channel Category ➔ Artist ➔ Title. (See pages 39–40 for more information on XM Radio operation.)

⓭ **Channel Select Button:** This button is used to start the process of manually setting the AVR 445's output levels to an external source. Once this button is pressed, press the ▲/▼ **Navigation Button** ⓮ to select the channel being adjusted, then press the **Set Button** ⓰, followed by the ▲/▼ **Navigation Button** ⓮ again, to change the level setting. (See page 41 for more information.)

⓮ **Navigation Button:** This disc-like button is used to navigate through the on-screen configuration menus, to scroll through option lists 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 specific task, pressing the button will either change the menu or a configuration choice, or 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 navigation controls are used.

⓯ **Digital Select Button:** Press this button to assign one of the digital inputs ㊲㊳ K L to a source.

⓰ **Set Button:** This button is used to enter settings into the AVR 445's memory. It is also used in the setup procedures for delay time, speaker configuration and channel output level adjustment.

⓱ **Transport Play Buttons:** These buttons have no direct function on the AVR 445, 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.

⓲ **Volume Up/Down Selectors:** These controls share the common disc in the lower section of the remote. To raise the volume, press the button marked ▲ by pressing toward the top of the remote. To lower

MAIN REMOTE CONTROL FUNCTIONS

the volume, press the button marked ▼ by pressing toward 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** ❹ have been pressed.

⓳ **Transport Fast-Play/Scan Buttons:** These buttons have no direct function on the AVR 445, 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.

⓴ **Main Transport Controls:** These buttons have no direct function on the AVR 445, 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 445, but when used with a compatibly programmed CD or DVD changer, they 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 445's memory.

NOTE: When the AVR 445 is used with The Bridge (optional) and your iPod, some of the buttons that are used to control the various transport functions on source devices are used to control the iPod, and navigate through its menus and content. Consult the owner's manual packed with The Bridge for more information.

㉓ **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, or to change the XM channel. 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 signal sufficient for adequate reception, MANUAL TUNED will appear in the **Lower Display Line** ⓮ 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** ⓮ 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 39 for more information on using the tuner.

㉔ **Disc Skip Button:** This button has no direct function for the AVR 445 but may be used to change the disc in a CD or DVD changer when the remote is programmed for that type of device.

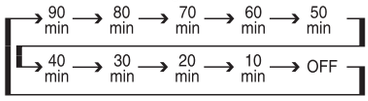
㉕ **Program Button:** This button is used to begin the process of programming the remote. Press and hold this button for 3 seconds to place the remote in the programming mode. Once the red LED under the **Set Button** ⓰ lights, release the button. You may then select from the desired option. (See pages 46–56 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 44 for additional 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 49 for more information on macros.)

㉙ **Sleep Button:** Press this button to place the unit in the Sleep mode. After the time shown in the display, the AVR 445 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.

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

㉛ **OSD Button:** Press this button to activate or turn off the On-Screen Display (OSD) system used to set up or adjust the AVR 445's parameters.

㉜ **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 on-screen display and in the **Lower Display Line** ⓮. To take the controls out of the signal path, press either of the ▲/▼ **Navigation Buttons** ⓮ until the display reads TONE OUT. To change the bass or treble set-tings, press the button again until the desired option appears in the **Lower Display Line** ⓮ and in the on-screen display and then press either of the ▲/▼ **Navigation Buttons** ⓮ to enter the desired boost or cut setting. See page 35 for more information on the tone controls.

㉝ **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** ❶ 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.

㉞ **Tuner/FM Select Button:** This button functions in two ways. Press it up, toward the top of the remote, to select the tuner as the AVR's input. The first press will call up the last-used station (or XM channel). Subsequent presses will select the last-used FM, AM and XM Radio station or channel. When the button is pressed down, toward the bottom of the remote, the last-tuned FM station is selected as the AVR's input.

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 46–56 for more information on programming the remote.

㊱ **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** ⓮ 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** ⓰ while the A/V SYNC DELAY message is visible, and then use the ▲/▼ **Navigation Buttons** ⓮ 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** ⓮ until the desired channel name is shown, and then press the **Set Button** ⓰.

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Use the ▲/▼ **Navigation Buttons** ⓮ to change the delay amount. (See page 30 for more information on delay options.)

㊲ **Speaker Select Button:** Press this button to begin the process of manually configuring the AVR 445's bass management system. Then press the ▲/▼ **Navigation Buttons** ⓮ to select the channel you wish to set up. Press the **Set Button** ⓰ and then select another channel to configure. When all adjustments have been completed, press the **Set Button** ⓰ twice to exit the settings and return to normal operation. (See page 28 for more information on manual speaker setup.)

㊳ **Memory Button:** Press this button to enter a radio station in the AVR 445'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 39 for more information on the tuner, and see page 40 for information on storing XM channel numbers in the preset memory.)

㊴ **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 53 for more information on renaming devices and keys.)

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 both 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 58 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 58 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 58 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 selects a Dolby Pro Logic II, Dolby Pro Logic IIx or Dolby Virtual Speaker mode, 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 58 for the available Dolby surround mode options.)

㊹ **6-Channel/8-Channel Input Select:** Press this button to select the device connected to the **8-Channel Direct Inputs** ㊴.

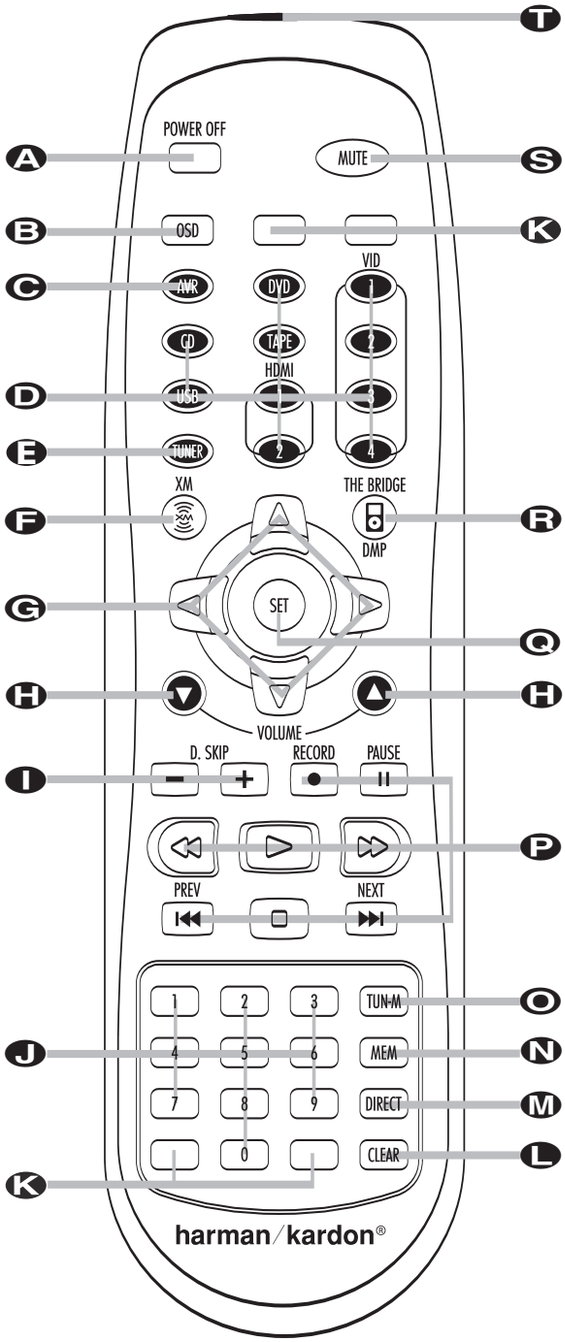
㊺ **Mute Button:** Press this button to momentarily silence the AVR 445 or TV set being controlled, depending on which device has been selected.

㊻ **Lens:** The infrared emitters behind the plastic lens at the top of the remote communicate the remote codes to the AVR 445. 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.

ZR 10 REMOTE CONTROL FUNCTIONS

- **A** Power Off Button
- **B** OSD Button
- **C** AVR Selector Button
- **D** Input Selectors
- **E** Tuner Selector
- **F** XM Radio Selector
- **G** Navigation Controls
- **H** Volume Up/Down Buttons
- **I** Disc Skip Buttons
- **J** Numeric Keys
- **K** Blank Buttons
- **L** Clear Button
- **M** Direct Button
- **N** Memory Button
- **O** Tuning Mode Button
- **P** Transport Controls
- **Q** Set Button
- **R** The Bridge™ /DMP Selector
- **S** Mute Button
- **T** IR Transmitter Lens



NOTES:

- The ZR 10 remote may be used either in the same room where the AVR 445 is located or in a separate room with an optional infrared sensor or A-BUS® product that is connected to the AVR 445's **Multiroom IR Input Jack** ㉔. When it is used in the same room as the AVR 445, it will control the functions of the AVR 445 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** ㉔, 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** ❾. (See page 44 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.

ZR 10 REMOTE CONTROL FUNCTIONS

A Power Off Button: When used in the room where the AVR 445 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 24**, this button turns the Multiroom system on and off.

B OSD Button: Press this button to activate or turn off the On-Screen Display (OSD) menu system, used to set up or adjust the AVR 445's configuration settings.

C AVR Selector Button: Press this button to turn on the AVR 445. The input in use when the unit was last on will be selected.

D Input Selectors: When the AVR 445 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 Tuner Selector: Press this button to select the Tuner as the input source and listen to the tuner band last used. Press the button again to change between AM, FM and, if an XM Connect & Play module is connected and activated, XM Radio.

F XM Radio Selector: Press this button to select XM Radio as the input source when an XM Connect & Play module is connected and activated.

G Navigation Controls: Depending on the menu or function in use, pressing these buttons will navigate through menus, scroll through option lists or configuration choices, or move the cursor position. Press the left, right, up or down button, as appropriate to the adjustment being made.

H Volume Up/Down Buttons: When the ZR 10 remote is used in the room where the AVR 445 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 24**, this button will raise or lower the volume in the remote room.

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

J Numeric Keys: Press these buttons to enter a station's frequency or an XM Radio channel number after the **Direct Button M** is pressed, or when programming the tuner memories. These buttons may also be used for numeric entries when appropriate with other compatible sources.

K Blank Buttons: These buttons are not active. Pressing them will not change or control any function on the AVR 445 or other IR devices.

L Clear Button: When programming the tuner memory, press this button to clear the current entry.

M Direct Button: Press this button when the tuner is in use to start the entry of a station's frequency or an XM channel number for direct access to that station or channel. After pressing this button, press the appropriate **Numeric Keys J**.

N Memory Button: Press this button to enter a station or XM channel number into the AVR 445's memory. First, tune to, or select, the desired station or channel, and then press this button. Within five seconds, while you see the station or channel flash in the **Upper Display Line 13** and in the on-screen display, press the **Numeric Keys J** for the preset number between 01 and 30 that you wish to assign to the station or channel. (See page 39 for more information.)

O Tuning Mode Button: When listening to AM or FM stations, 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 23 P** 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 23 P** 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 41 for more information on AM/FM tuner operation.) When listing to XM Radio, press this button to scroll through the following display options for the **Lower Display Line 14**: Channel Name ➛ Channel Category ➛ Artist ➛ Title. (See pages 39–40 for more information on XM Radio operation.)

P Transport Controls: Press these buttons to control the operation of a compatible Harman Kardon DVD or CD player when the AVR 445 is connected to the source unit via the **IR Input Jack 16**. When the AVR 445's tuner or XM Radio is in use, the **⏮/⏭ Prev/Next Buttons P** are used to tune up or down through the list of preset stations, station frequencies or channel numbers.

Q Set Button: When using the configuration menus, press this button to enter a setting to the AVR's memory.

R The Bridge Digital Media Player Selector: When Harman Kardon's The Bridge (optional) is connected to **The Bridge Digital Media Player (DMP) Input 10** and a compatible iPod is docked in The Bridge, pressing this selector will select the iPod as the audio source input device for the AVR 445. In addition, if a video display is connected to one of the **Video Monitor Outputs 23 26**, the iPod's messages will appear on screen, and in the **Upper** and **Lower Display Lines 13 14**. The **▲/▼/◀/▶ Buttons G**, the **Set Button Q** and the **Transport Controls P** may be used to navigate the iPod and to operate many functions. See page 39, and the manuals for The Bridge and your iPod for more information.

S Mute Button: When the ZR 10 remote is used in the room where the AVR 445 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 24**, this button will temporarily silence the feed to the remote room only. Press the button again to return to the previous volume level.

T IR Transmitter Lens: The infrared code commands from the remote are sent to the AVR from the components behind this lens. To ensure proper operation, do not block this area when holding the remote.

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.

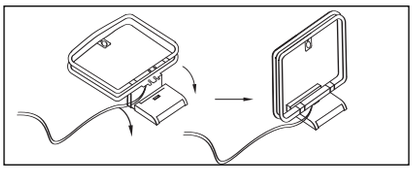
Audio Equipment Connections

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 ❼**.

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 ❺**. Connect the analog Record/In jacks on the recorder to the **Tape Outputs ❸** on the AVR 445.
3. Connect the output of a digital source such as a CD or DVD changer or player, a video game, a digital satellite receiver, an 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 ㊲㊳ K L**.
4. Connect the coaxial or optical **Digital Audio Outputs ㉞㉟** on the rear panel of the AVR 445 to the matching digital input connections on a CD-R, MiniDisc or other digital 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 Antenna Connections ㊺** .



6. Connect the supplied FM antenna to the **FM Antenna Jack ㊹**. 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 adapter to make the connection.
7. Connect the front, center, surround and surround back speaker outputs ❻❽⓮⓯ 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 when 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 label 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 445.

8. Connections to a subwoofer are normally made via a line-level audio connection from the **Subwoofer Output ❷** 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 audio source such as a DVD-Audio, SACD or high-definition optical disc player with 5.1 or 7.1 analog audio outputs is part of your system, connect the outputs of the source to the **8-Channel Direct Inputs ㊴**.

Analog Video Equipment Connections

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

1. Connect the Video Play/Out jacks of a standard (composite) video (or S-video outputs of a digital video) recorder or conventional VCR to the **Video 1 Video Inputs ㉘** on the AVR 445. Connect the Record/In jacks from that device to the **Video 1 Video Outputs ㉙** on the AVR.
2. Connect the analog Audio Left/Right Play/Out jacks of the device connected to the Video 1 Inputs to the **Video 1 Audio Inputs ㊵** on the AVR. Connect the analog Audio Left/Right Record/In jacks from that device to the **Video 1 Audio Outputs ㊸** on the AVR. If the device has a digital audio output, connect it to one of the **Coaxial ㊲** or **Optical ㊳** digital audio inputs.
3. Connect the Play/Out jacks of a standard (composite) video or (S-video outputs of a digital video) playback source such as a set-top box or video game console to the **Video 2 Video Inputs ㉚** or **Video 3 Video Inputs ㉛**. If the device has analog component video (Y/Pr/Pb) outputs, connect them to one of the **Component Video Inputs ㉕**.
4. Connect the analog audio outputs from the source to the matching **Video 2 Audio Inputs ㊶** or **Video 3 Audio Inputs ㊷**. If the device has a digital audio output, connect it to one of the **Coaxial ㊲** or **Optical ㊳** digital audio inputs.
5. If any of the video source devices has analog component video (Y/Pr/Pb) outputs, but not HDMI, connect them to **Component Video Inputs ㉕**. The chart on page 59 has the default settings for various source devices, but you may make any connection and change the configuration setting using the IN/OUT SETUP menu, as described on page 23.
6. The default video connection for a DVD player is to use the **Component Video Input 3 Jacks ㉕** on the AVR, but you may change this assignment in the IN/OUT SETUP menu (see page 23). A DVD player's composite and S-video outputs may also be connected to the **DVD Video Inputs ㉗**. Only one connection type is required.

INSTALLATION AND CONNECTIONS

7. The default audio connection for a conventional DVD player is to link the coaxial digital audio output on the DVD player to the **Coaxial 1 Digital Audio Input** ㊲, but you may also make a connection to either the **Coaxial** ㊲ or **Optical** ㊳ digital inputs, or to the **Analog DVD Audio Inputs** ㊱. You may change the assignment in the IN/OUT SETUP menu as described on page 22, or by using the front-panel **Digital Input Selector** **F**.
8. To use a portable audio/video product such as a camcorder, media player or digital still camera with the AVR, or connect a video game console or other source that may not always be connected to the AVR, connect the video outputs of the source to the **Video 4 Input/Output Jacks** **N**, behind the **Front-Panel Door** **9**. If the source has digital audio outputs, connect them to the **Optical 4 Digital Input** **K** or the **Coaxial 4 Digital Input** **L**.

   CONNECTION NOTES:

   - When making connections to the **Component Video Inputs** ㉕ or the **Coaxial** ㊲ or **Optical** ㊳ digital audio inputs, it is a good idea to make note of which jacks are connected to which source, using the Worksheet in the Appendix. This will help simplify the configuration process.
   - When connecting a source device such as a cable set-top box where the audio streams may change between digital and analog as you change channels, we recommend that you make both analog and digital connections. The AVR's Auto Poll feature will automatically sense when the digital stream is replaced by an analog output and switch the input accordingly. (See page 22 for more information on the Auto-Poll feature.) This dual connection is not required for sources (such as DVD players or video games) that always output a digital stream.
9. Connect the AVR to your video display using one of the following connections, even if you will also use an HDMI connection:
   - If your video display has component video inputs (Y/Pr/Pb), connect the **Component Video/Monitor Outputs** ㉓.
   - If your display does not have digital or component video inputs, connect the **Video Monitor Output** ㉖ on the AVR to the matching input on your display. Only one connection is needed, and S-video is the higher quality signal.

HDMI Connections

HDMI™ is the abbreviation for High-Definition Multimedia Interface, which is quickly becoming the standard for connections between high-definition video/audio source products and displays. HDMI is a digital connection, eliminating the need to convert signals back and forth from digital to analog.

Some source or display components in your system may use DVI (Digital Video Interface) for digital video connections. DVI carries the same digital video signals as HDMI but uses a larger connector and does not transport audio or control signals. In most cases, you may mix and match DVI and HDMI digital video connections by using optional connector adapters. Note, however, that some DVI-equipped video displays are not compatible with the HDCP copy protection coding that is increasingly carried with signals connected via HDMI. If you have an HDMI source and a DVI-equipped display, you may occasionally be unable to view a program if the display does not include HDCP. This is not the fault of the AVR or your source; it simply indicates that the video display is not compatible.

The AVR 445 is equipped for HDMI switching, which means that it is able to select either of the two HDMI inputs as the source that feeds your system's video display. This preserves the digital signal in its original form by passing it directly through from source to display. However, this also means that the AVR does not have access to the signal and thus it is not able to add menus or on-screen messages to HDMI signals, or to process the audio that may be part of the signal in an HDMI connection.

Therefore, the following connections are required when the AVR 445 is used with HDMI sources:

- Connect the HDMI output of a source to either of the **HDMI Inputs** ㉒.
- Connect the **HDMI Output** ㉑ of the AVR to an HDMI input on your display.
- Connect either an optical or coaxial digital audio output from the source to the AVR. The default connections are **Optical 3** ㊳ for a source connected to **HDMI 1** ㉒ and **Coaxial 3** ㊲ for a source connected to **HDMI 2** ㉒. You may use any digital or analog audio source in conjunction with the HDMI inputs, but if it varies from the default you must make a change to the input's setting, as shown on page 22.
- *Even when HDMI inputs are used, it is important to make sure that a component, S-video or composite video connection is made between the AVR and your display. This is needed to view both the setup menus and on-screen messages, and to view other (non-HDMI) video sources. The AVR 445 does not convert analog video signals to HDMI.*

System and Power Connections

The AVR 445 is designed for flexible use with multiroom 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 **IR Input** ⑯.

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 **IR Output** ⑬ to the Remote IR Input jack on Harman Kardon or other compatible equipment.

If other Harman Kardon-compatible source equipment is part of the main room installation, the **IR Output Jack** ⑬ on the rear panel should be connected to the **IR IN** jack on source equipment. This enables 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 hard-wire connection or use an optional, external IR "blaster" connected to the **Full Carrier IR Output** ⑫. 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" IR commands. When "full carrier" commands are used, make the connection to the **Full Carrier IR Output** ❶. Otherwise, make the connection to the **IR Output** ⑬.

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 Audio Connections

The AVR 445 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 requirements, three options are available for audio connection:

Option 1: Use high-quality, shielded audio interconnect cable from the AVR 445'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 445, plug the audio interconnect cables into the **Multiroom Audio Outputs** ❾ on the AVR 445's rear panel.

Option 2: Connect the **Multiroom Audio Outputs** ❾ on the AVR 445 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 445'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 445 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 ⓯**. 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 44.

NOTE: For all options, you may connect an optional IR sensor in the remote room to the AVR 445 via an appropriate cable. Connect the sensor's cable to the **Multiroom IR Input ㉔** on the AVR 445 and use the ZR 10 remote to control the room volume. You may install an optional volume control between the output of the amplifiers and the speakers in options 1 and 2.

A-BUS® Installation Connections

The AVR 445 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 445 with an approved A-BUS product, simply connect it to the AVR 445 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.

No further installation or adjustment is needed, as the A-BUS jack on the AVR 445 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 445's multiroom system and menus.

RS-232 Connections

The AVR 445 is equipped with an **RS-232 Serial Connection Port ⓴** that may be connected to a compatible, optional, external computer, keypad or control system for bidirectional 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 physical connection to the AVR 445'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.

USB Connections

The AVR 445 is one of the few A/V receivers to offer a USB connection that may be used for both playback of compatible audio content from a computer and for loading of system updates (when available).

The physical connection between a computer and the AVR is a simple one, requiring only a cable with a USB "A" type connector on one side and a USB "Mini B" on the other.

Connect the larger, "A" connector on the cable to your computer or a USB hub and the end with the "Mini" USB connector to the **USB Port ㉝** on the AVR's rear panel.

NOTES ON USB:

- The USB port on the AVR 445 is to be used only for connection to a computer or a hub connected directly to a computer. DO NOT connect it to other devices such as portable audio players, card readers, USB memory storage devices, external hard drives, USB accessories, digital cameras or cellular phones. Connection to these devices may cause damage to the device and/or the AVR that is not covered by the AVR's warranty.
- The AVR 445's USB connection may only be used for audio playback and system upgrades. It may not be used for other purposes, such as system control, video or still-image playback.

Trigger Connection

The AVR 445 is equipped with a low-voltage trigger that may be used to control a wide variety of compatible, optional devices that respond to voltage actuation commands. This includes external audio power amplifiers, video screens, motorized blinds and other compatible products in a home theater or automation system. **Due to the complexity of interfacing with power-controlled devices, we strongly recommend that they be installed by a qualified professional.**

The **Trigger Output ⓲** delivers 6 volts DC when activated, and removes the voltage when the AVR is turned off. The connection is a 3.5mm mono mini plug with the signal on the center pin ("tip") and the outer shaft ("ring") acting as the negative or ground connection.

The **Trigger Output ⓲** is for use with devices such as power amplifiers that you wish to activate whenever the AVR is turned on, regardless of the input selected.

After checking for voltage, current and polarity compatibility between the device being controlled and the AVR, simply connect one end of the trigger cable to the device being controlled and the other end to the **Trigger Output ⓲** on the AVR.

IMPORTANT NOTE ON THE TRIGGER CONNECTION:
The current draw from the trigger jack cannot exceed 1.0mA.

XM Radio Connections

XM Radio is a satellite-delivered, subscription-based, programming service that provides a wide range of music, sports, news and information programming with digital audio quality. The AVR 445 is XM Connect & Play-ready, which means that you can easily add the XM service to your home audio system by purchasing an XM antenna module, activating an account with XM and then making a simple, single-cable connection to your AVR.

To purchase an XM antenna module, consult your dealer, or contact XM Radio at www.xmradio.com. After following the instructions packed with the module, place the XM antenna near a south-facing window and run the cable to the AVR. Connect the plug at the end of the cable to the **XM Ready Input ㉜**. Once the connection is made, follow the instructions on page 39 for more information on listening to XM Radio.

NOTES on XM Radio:

- XM Radio requires the purchase of additional, optional hardware and a separate subscription to the XM service.
- XM Radio is available only in the continental United States and Canada. It is not available in Alaska or Hawaii.
- XM reception requires that the antenna be able to "see" the XM satellites or receive a signal from one of the XM ground-based repeaters. Depending on your installation and location, XM service may not be available in some areas.

AC Power Connections

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

This **Switched AC Accessory Outlet ⓱** is powered only when the unit is on. This is recommended only 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 AVR 445 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 ⓳**.

The AVR 445 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 445's incredible power and fidelity!

SYSTEM CONFIGURATION

When all audio, video and system connections have been made, the final steps before listening to your new AVR are to make the configuration adjustments that tailor the unit to the other components in your system, as well as accommodate your personal listening preferences. A few minutes spent to correctly calibrate and configure your system will greatly add to your listening pleasure.

Speaker Selection and Placement

While the most seamless surround sound reproduction comes from the use of speakers with identical or carefully matched driver elements at each position, no matter which brand or type of speakers you prefer, it is always best to use the same model or series for the left front, center and right front speakers. Similarly, it is also desirable to use the same model or series for the surround speakers. This ensures that the soundstage will be relatively seamless when a sound moves from one side of the room to the other.

Speaker Placement

Once you have selected your speakers, it is important that they be placed in positions that enable them to do the best job of reproducing the sound as it was meant to be heard, regardless of the program content. The placement of speakers can have a noticeable impact on the accuracy of the surround process, particularly in multichannel systems.

When placing your speakers in a listening room, picture an imaginary circle starting at the center of your video screen that arcs around the room with the prime listening position, or "sweet spot," at the center of the circle. Depending on the number of speakers in your system, there is a recommended placement along the circle for each speaker, though the specific construction of your room, taking into account the available walls, bookcases, or floor space at which the speakers may be placed will obviously have some impact on where the speakers are ultimately located. As a general rule, try to place all speakers so that they are positioned at the same height as your ears when you are seated at the prime listening position.

Use the following suggestions as a guide, and make the changes needed to fit the speakers to your room. Don't be afraid to experiment a bit until you find the right combination of locations that works for you. At the end of the day, there is no real "right" or "wrong" place to put the speakers; work to optimize their locations so that audio moves across the front of the room smoothly, without seeming to jump from one speaker to another.

Front Left/Right Speakers

The recommended placement for front left/right speakers is at the 30-degree position with reference to the center channel speaker. The distance between them should be about the same as the distance from the center channel speaker to the prime listening position.

Although the natural tendency is to place the speakers so they are parallel to the wall behind them, and thus in line with the video screen, the preferred placement is to angle the speakers slightly ("toe in") so that they point at the prime listening position.

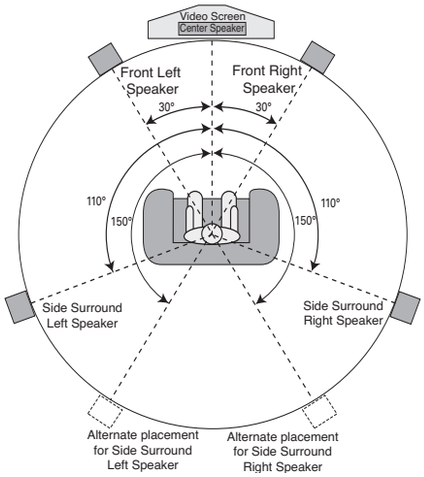
Center Channel Speaker

The ideal location for the center channel speaker is at "0 degrees" in our circle, directly in front of the prime listening position. Place the center channel speaker as close to the top (or bottom) of the video screen as possible so that when you position the front left/right speakers the tweeters of all three front channel speakers are within 24" of one another.

Surround Speakers for 5.1 Systems

In a 5.1 surround system, an additional pair of left/right speakers is added. Although many believe that these speakers should be placed at the rear of the room, the preferred position for them is at the sides of the room, with rear placement a second option when room conditions prevent the use of side-mounted surround speakers.

When side-wall placement is possible, place the left/right surround speakers at a point that is 110 degrees along our circle from the center of the video screen. This translates to placing them to the side and slightly behind your preferred listening position. If possible, angle the speakers in slightly so that they are pointing toward the listener's ears.



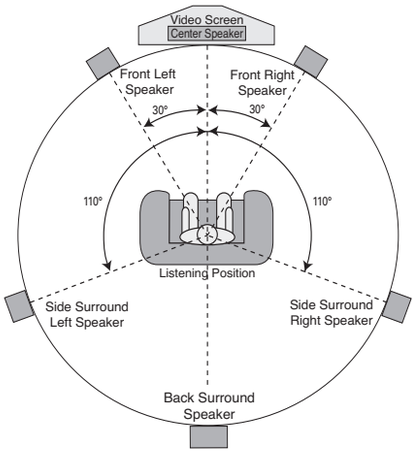
5.1 Placement Diagram

If it is not possible to place the surround speakers at the sides of the room, the alternate position is at the back of the room, at a spot that is about 150 degrees around our circle from the center of the video screen. Another way to spot the optimal, alternate rear-wall mounting position is to place the left surround speaker on the back wall so that it points directly at the front right speaker, and to have the right surround speaker point directly at the front left speaker. If possible, aim the surround speakers so that they point inward, toward the listening area, rather than perpendicular to the walls.

Surround Speakers for 6.1 Systems

A 6.1 surround system adds an additional speaker in the center back surround position. We do not recommend this configuration, as it will not deliver a full surround sound field when any 7.1-channel mode is used, since some signals will be sent to an output (either left or right) where no speaker is present.

If a 6.1 system is to be used, first place the speakers for a 5.1 system, and place the "sixth" speaker at the center of the back of the room, pointing directly toward the front center channel speaker.



6.1 Placement Diagram

Do not connect the center back surround speaker at this time, as you must first run EzSet/EQ as shown on page 26 so that the system configures the five main channel speakers only. After completing the EzSet/EQ process, connect the center surround back speaker to one of the **Surround Back Speaker Outputs** ⓯ and manually configure the system for surround back speakers, as shown on pages 29–30. DO NOT run EzSet/EQ with only a single surround back speaker connected, as a failure message will result.

We recommend that you consider adding a second surround back speaker for a full 7.1 system, as soon as possible.

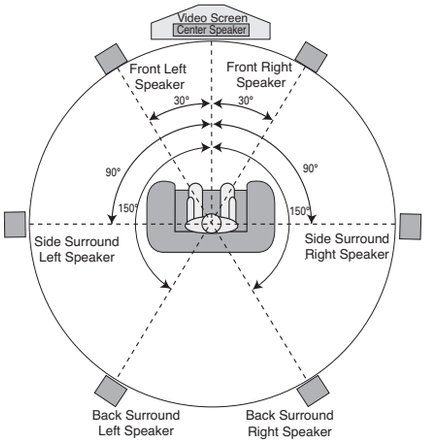
Surround Speakers for 7.1 Systems

For the ultimate home theater experience, a 7.1 surround system uses both traditional surround left/right channels and a surround back left/right speaker pair. In a 7.1 system, the front left/center/right speakers remain in the same place as they would be for a 5.1 or 6.1 system, but due to the number of speakers involved, the placement of the surround speakers is different.

In a 7.1 system, you should place the main surround left/right speakers at the 90-degree point on our cir-

cle. A good way to visualize proper surround speaker positioning for 7.1 is to place the speakers directly to the left and right of the ears of someone sitting in the prime listening spot. The two speakers should ideally face toward each other.

The additional Surround Back Left/Right speakers are placed at about 150 degrees on the circle, pointing inward, toward the listening area. The easiest way to visualize the placement of these speakers is to place the surround back left speaker directly opposite the right front speaker and to place the surround back left speaker directly opposite the left front speaker.



7.1 Placement Diagram

Subwoofer Placement

Since subwoofers produce nondirectional sound, 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 six 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 particular listening room.

For more information on subwoofer placement, as well as a variety of topics relating to audio and home theater, visit the Technology section of our Web site at www.harmankardon.com. Links are provided there to informative white papers written by the acoustic and electronics experts at Harman Kardon and at our parent company, Harman International Industries, Inc.

NOTES ON SPEAKER PLACEMENT:

1. The limitations of your listening room, including the placement of walls and furniture, may make it difficult to follow the speaker placement suggestions shown above. Depending on the specific layout of the room, here are some ways to compensate for unusual conditions:
   - Try to follow the suggested placement, but move the speakers within a few feet from the preferred locations.
   - Regardless of where they are placed, always try to make certain that the main surround speakers are the same distance from the front speakers. (For example, try not to have the right surround speaker further back into the room than the left surround speaker.)
   - If it is not possible to wall-mount or place speakers on a shelf, consider the use of optional floor stands, available for many speakers.
2. When using ceiling-mounted in-wall speakers, follow the same guidelines shown for conventional floorstanding or shelf-mounted speakers.

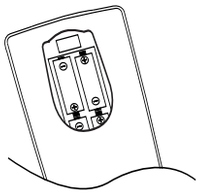
System Setup

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 video or audio adjustments, select a surround mode, program the AVR 445'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 445 to begin these final adjustments.

1. Make certain that the AC power cord is firmly inserted into the **AC Power Cord Socket** ⑲ 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.
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 the four supplied AAA batteries in the main remote as shown. Be certain to follow the (+) and (–) polarity indicators that are in the battery compartment. (The ZR10 remote requires two AAA batteries.)



5. Turn the AVR 445 on either by pressing the **Standby/On Switch** **1** on the front panel, or via the remote by pressing the **Power On Button** ❷, the **AVR Selector** ❺Ⓒ or any of the **Input Selectors** ❹㉞㊹ⒸⒹⒻⒺⓇ 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 445'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 that you have made a video connection to the appropriate matching input of your TV or projector. In order to view the AVR 445's displays, the correct video source must be selected on the video display. On-screen menus may be viewed through component, S-video or composite video connections, but they are not available when an HDMI source is selected as the input or through the **HDMI Output** ㉑.

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 display. This type of damage is not covered by the AVR 445 warranty and may not be covered by the projector/TV set's warranty.

The AVR 445 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.

SYSTEM CONFIGURATION

Making Configuration Adjustments

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

```
** MASTER MENU **

→ IN/OUT SETUP
  AUDIO ADJUST
  SURROUND SETUP
  EZSET/EQ
  MULTI-ROOM
  ADVANCED
```

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 15** and then press the **▲/▼ Navigation Button 14** to scroll through the list of options as they appear in the on-screen display or in the **Lower Display Line 14**.

Semi-OSD messages are available only when a 480i input source is being viewed. They are not available when a 480p, 720p or 1080i source or an HDMI input is selected.

To use the full-OSD menu system, press the **OSD Button 31 B**. When the menu is on the screen, press the **▲/▼ Navigation Button 14 G** until the on-screen ➔ cursor is next to the item you wish to adjust, and then press the **Set Button 16 Q** to adjust that item. The menus 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 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 two lines 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 445 features an advanced memory system that enables you to establish different configurations for the component video assignment, digital input and surround mode and other settings for each input source. This flexibility enables you to customize the way in which you listen to each source and have the AVR 445 memorize those settings. Once these settings are made, they will automatically be recalled whenever you select that input.

To simplify initial configuration and operation, the AVR 445 has been preconfigured with input settings that are typical for home theater systems. These settings are detailed in the worksheets in the Appendix. Before adjusting the input settings, it is a good idea to compare your input connections to the defaults so that you may see where changes need to be made.

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 video display and speakers installed, and the surround mode specifics of your home theater system.

In/Out Setup

The first step is to configure each input source. When an input is selected, the settings will "attach" themselves to that input and be stored in a nonvolatile memory. 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 done, they need not be changed again unless your system components have changed.

When using the full-OSD system to make the setup adjustments, press the **OSD Button 31 B** once so that the MASTER MENU (Figure 1) appears. The cursor will be next to the IN/OUT SETUP line. Press the **Set Button 16 Q** and the first page of the IN/OUT SETUP menu (Figure 2) will appear on the screen. Press the **◀/▶ Navigation Button 14 G** until the desired input name appears in the highlighted video, as well as being indicated in the front-panel **Input Indicators 11**.

```
    * IN/OUT SETUP *
→ SOURCE: VIDEO 1
  TITLE:
  AUDIO IN-PORT: ANALOG
  AUDIO AUTO POLL: OFF ON
  VIDEO IN PORT: AUTO
  COMPONENT INPUT: COMP 1
  VIDEO PROCESS: V CONVER
  A/V SYNC DELAY:  0 mS
  MASTER MENU   PAGE 2
```

Figure 2

When any input other than the tuner, 8-channel inputs or the USB input, 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 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 Buttons 14 G** on the remote so that the cursor is pointing to TITLE. Next, press and hold the **Set Button 16 Q** for a few seconds until a flashing box appears to the right of the colon. Immediately release the **Set Button 16 Q**, as you are now ready to enter the device name.

Press the **▲/▼ Navigation Buttons 14 G** and note that 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 14 G**, the symbols and numbers will appear first, 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 14 G**.

When the desired character appears, press the **▶ Navigation Button 14 G** 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 16 Q** to enter the input name into the system memory and to proceed with the configuration process.

After entering the input title, press the **▲/▼ Navigation Buttons 14 G** to move to the next line.

The audio input defaults are shown in the table in the Appendix. If your system configuration follows the default table, no changes are needed and you may press the **▲/▼ Navigation Buttons 14 G** to move to the next line.

With the cursor pointing to AUDIO IN-PORT, press the **◀/▶ Navigation Buttons 14 G** to change the default to a different audio input connection. When the name of the desired input appears, press the **▲/▼ Navigation Buttons 14 G** to move to the next line.

In normal operation, when a digital audio stream is interrupted, the unit will automatically switch to the analog inputs associated with that source. This is particularly useful with cable set-top boxes where the input is normally digital, but occasionally changes to analog. If you wish to configure an input so that the auto-poll circuit is turned off, while the on-screen cursor is pointing to the AUDIO AUTO POLL line, simply press the **◀/▶ Navigation Buttons 14 G** so that OFF (rather than ON) is highlighted.

When the desired auto-poll setting is entered, press the ▲/▼ Navigation Button 14G to move to the next line.

When the cursor is at the VIDEO IN-PORT line, you are able to select an alternative to the default input setting for the video input associated with any source except HDMI 1 and HDMI 2. For the Video 1 and Video 4 inputs, the factory default of AUTO will select either composite or S-video, depending on which has an active signal. For the Video 2, Video 3 and DVD inputs, the AUTO setting will normally select the default component input, but if it is not in use, the system will revert to a composite or S-video output if either one is active. You may set COMPONENT INPUT to OFF if you aren't using component video, and the AVR will not select the component video inputs.

To have the AVR always look to a specific source connection when an input is selected, make certain that the on-screen cursor is pointing to the VIDEO IN-PORT line; then press the ◀/▶ Navigation Buttons 14G until the name of the desired input appears. Note that this setting is not available when the HDMI inputs are selected. The choice of available inputs may vary according to whether an audio-only source (such as the tuner, CD or tape) or an audio/video source (such as Video 1–Video 4 or DVD) is selected.

When the desired video input setting has been made, press the ▲/▼ Navigation Buttons 14G to move to the next line.

If your system includes any sources that are equipped with Y/Pr/Pb component video outputs, the AVR 445 is able to switch them to send the proper signals to your video display. Each of the Component Video Inputs 25 is assigned to a default source, as shown in the table in the Appendix, but if you have connected your system differently than the factory settings, you may select any of the three inputs for any source except the HDMI inputs or the Tuner. If you do not need to change these defaults, press the ▼ Navigation Button 14 to go to the next setting.

To change the Component Video assignment, first make certain that the cursor is pointing to the COMPONENT INPUT line on the menu screen, and then press the ◀/▶ Navigation Button 14G until the desired input is highlighted.

When the desired component input has been selected, or component video has been disabled by selecting OFF, press the ▼ Navigation Button 14G to go to the next setting.

At the VIDEO PROCESS line, you are able to select whether video format conversion is to be used with the input source being configured. If you do not need to change the setting, simply press the ▲/▼ Navigation Buttons 14G to continue.

The default setting of V-CONVERSION will output the incoming video in one of the following ways, depending on the input source.

- A standard-definition (480i) analog signal (composite, S-video or component) will be converted so that it is available at its input resolution, at the standard composite, S-video or component analog video outputs. The signal will also be available at the record outputs.
- An analog component high-definition signal will be output at its input resolution as an analog component signal, but not through the analog composite or S-video monitor, or HDMI or record outputs.
- HDMI input signals, regardless of their resolution, will be output through the HDMI outputs only.

The BYPASS setting will not apply any video conversion to the incoming video signal, but it will output it in one of the following ways, depending on the input source.

- Analog signals (composite, S-video or component) will output only in the resolution and format that matches the input for both the main "Monitor" connection as well as for the record outputs.
- HDMI input signals, regardless of their resolution, will be output through the HDMI outputs only.

After any needed change to the video conversion setting has been made, press the ▲/▼ Navigation Buttons 14G to move to the next line.

At the A/V SYNC DELAY line, you are able to enter a setting that delays the audio output slightly behind the video so that the loss of lip sync that may occur due to digital video processing in the transmission of a program, in the playback unit or in the display is corrected. This lack of lip sync is not a fault of the sources; rather, it is a by-product of video signal processing. In most cases, we recommend that the delay adjustment be made using the direct-access controls on the remote so that you may more accurately adjust the delay while viewing the on-screen image, following the instructions shown on page 30, but you may also make it here using the menu system. As the amount of delay needed may vary from one source to another, we strongly recommend that you adjust it for each input.

To adjust the A/V sync delay time from the IN/OUT SETUP menu, make certain that the cursor is pointing to the A/V SYNC DELAY line, and then press the ◀/▶ Navigation Buttons 14G until the desired amount of delay is applied so that the on-screen video matches the audio.

When all configuration adjustments on this menu screen have been made, press the ▲/▼ Navigation Buttons 14G until the on-screen cursor is pointing to PAGE 2 and then press the Set Button 16Q to move to the second screen of input/output settings. If all settings for input configuration are complete, press the ▲/▼ Navigation Buttons 14G until the on-screen cursor is pointing to MASTER MENU and then press the Set Button 16Q to return to the main menu screen.

The second page of the IN/OUT SETUP menu (Figure 3) allows you to further configure the AVR 445 for special custom features.

```
    * IN/OUT SETUP *

➔VIDEO  4 :IN OUT
 REC OUT  :ANALOG
 MASTER MENU PAGE 1
```

Figure 3

An exclusive Harman Kardon feature is the ability to switch the front-panel analog audio/video jacks from their normal use as inputs to output connections so that portable recording devices may easily be connected.

The front-panel analog Video 4 Jacks N are normally set as inputs for use with camcorders, video games and other portable audio/video products, but they may be switched to outputs. First, make certain that you are at the second page of the IN/OUT SETUP menu. Press the ▼ Navigation Buttons 14G until the cursor points to the VIDEO 4 line. Press the ◀/▶ Navigation Buttons 14G so that the word OUT is highlighted. The Input/Output Status Indicator M between the S- and composite video jacks will turn red, indicating that the analog Video 4 jacks are now record outputs.

NOTE: Selection of the front-panel jacks as outputs will remain effective as long as the AVR 445 is on. Once the unit is turned off, the jacks will revert to their normal use as inputs when the unit is turned on again.

The REC OUT line enables you to select the audio output at the analog record outputs for the input source being configured. Press the ◀/▶ Navigation Buttons 14G to choose one of the following (the default setting is ANALOG):

- ANALOG selects an unprocessed pass-through of an analog source and is the default setting for most inputs.
- DSP DOWNMIX selects a two-channel downmix of a multichannel digital input.

SYSTEM CONFIGURATION

When all settings on this page are complete, press the ▲/▼ Navigation Buttons 14G until the on-screen cursor is pointing to PAGE 1 and then press the Set Button 16Q to return to the main IN/OUT SETUP menu to configure another input, or if no further input configuration adjustments are needed, press the ▲/▼ Navigation Buttons 14G until the on-screen cursor is pointing to MASTER MENU and then press the Set Button 16Q to return to the main menu screen.

Audio Setup

This menu allows you to configure the tone controls. If you do not wish to change any of those settings at this time, proceed to the next menu screen. To make configuration changes to those parameters, first make certain that the MASTER MENU is on screen with the cursor pointing to the AUDIO SETUP line, and press the Set Button 16Q. The AUDIO SETUP menu (Figure 4) will appear.

```
    * AUDIO SETUP *

→TONE   :    IN OUT
 BASS   :       0
 TREBLE:        0

 BACK TO MASTER MENU
```

Figure 4

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 Buttons 14G so that OUT is highlighted.

If you wish to leave the tone controls in the signal path, the amount off boost or cut for bass and treble may be adjusted up to ±10dB in 2dB steps by pressing the ▲/▼ Navigation Buttons 14G so that the cursor is next to BASS or TREBLE, depending on which setting you wish to adjust. Next, press the ◀/▶ Navigation Buttons 14G until the desired setting is shown.

When all desired changes have been made on this menu, press the ▲/▼ Navigation Buttons 14G so that the cursor is next to the BACK TO MASTER MENU line; press the Set Button 16Q.

Surround Setup

The next step is to set the surround mode you wish to use with the input that was previously selected in the IN/OUT 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 445, we suggest Logic 7 (Cinema or Music) for most analog inputs. For 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 58 for information on 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.

To begin the surround setup process, from the MASTER MENU (Figure 1), press the ▲/▼ Navigation Buttons 14G until the cursor is next to the SURROUND SETUP line. Press the Set Button 16Q until the SURROUND SETUP menu (Figure 5) is on the screen.

```
  *  SURROUND SETUP  *
→SOURCE:  VIDEO 1
 AUDIO IN PORT: ANALOG
 AUDIO IN: PCM 44.1kHz
 ADC SAMPLING: 48kHz
 SURR MODE: LOGIC 7
 SURR SELECT: MUSIC 5.1
 DEFAULT SURR: ORIGINAL
 SURROUND CONFIG
 DOLBY SURR SETUP
 BACK TO MASTER MENU
```

Figure 5

The first line on the menu allows you to select the input for which the specific surround settings will be applied. Press the ◀/▶ Navigation Buttons 14G to select the input source to be configured.

The AUDIO IN-PORT and AUDIO IN lines are for display only and may not be changed through the SURROUND SETUP menu. The AUDIO IN-PORT displays the physical connection source for the current active input, and the AUDIO IN line shows the signal type present. Note that an UNLOCK message in the AUDIO IN line indicates that a digital input has been selected for that source, but that no data stream is present.

When the input selection has been made, press the ▲/▼ Navigation Buttons 14G to move to the next configuration line.

The ADC SAMPLING line is where you determine whether the unit's upsampling feature is turned on or off. The default setting of 48kHz puts the feature in a bypass, or "off," mode and will pass digital audio data through the DSP at its native sample rate. To process incoming 44.1kHz signals at a higher resolution, upsampled 96kHz sample rate, press the ◀/▶ Navigation Buttons 14G once so that 96kHz appears.

When the desired setting has been made, or if no adjustment is required at this line, press the ▲/▼ Navigation Buttons 14G to move to the next configuration line.

The SURR MODE and SURR SELECT lines are related, as they guide you to the choice of the surround mode that will be activated whenever the input being configured is selected.

At the SURR MODE line, press the ◀/▶ Navigation Buttons 14G to select the surround mode group (such as Dolby modes, DTS modes, Logic 7 modes, and DSP or Stereo modes) that is applicable to the input source. After making a selection, press the ▲/▼ Navigation Buttons 14G to move to the SURR SELECT line.

At the SURR SELECT line, you are able to choose the specific mode to be used from within the major surround mode group. The choice of modes is governed by the input type (as some modes such as Dolby Digital or DTS-ES are not available for analog sources), as well as by the speaker configuration, since some modes are only available when a full 7.1 speaker complement is present. The full list of available modes is detailed in the surround mode chart on page 60. Also, you may also use the settings in the SURROUND CONFIG menus to delete modes you do not normally use from the available choices.

When both a surround mode group and a specific surround mode have been selected, press the ▲/▼ Navigation Buttons 14G to move to the next configuration line.

The DEFAULT SURR mode line is where you choose the mode that is activated when a digital source is selected. LAST will activate the last-used mode for any digital source. If you prefer to always have a digital source switch to the specific mode encoded by digital data flags in the incoming audio data stream, press the ◀/▶ Navigation Buttons 14G so that ORIGINAL appears.

Before proceeding to the SURROUND CONFIG line, it is worth noting that the settings in the submenus attached to that line may require a considerable amount of time to complete. Although they are useful in that they allow you to customize the list of surround modes that appear in normal use of the AVR, you may wish to bypass those settings at this time so that you may complete the configuration process. You may return to this menu line at a later time, once you have had a chance to listen to the various surround modes and determine which you want to "keep" and which you do not want to use. The settings in this line

are not primary controls and do not impact the way the AVR "sounds."

To proceed to the SURROUND CONFIG line, press the ▲/▼ Navigation Buttons 14 G to move to that line; otherwise, press it again to move to the DOLBY SURR SETUP line and skip to the instructions for that setting.

The SURROUND CONFIG line is your gateway to a broad range of surround mode configurations. To continue, press the Set Button 16 Q to go to the main SURROUND CONFIG menu (Figure 6).

```
** SURROUND CONFIG **

➔LOGIC 7 GLOBAL:OFF
 DOLBY MULTI CONFIG
 DOLBY 2.0 CONFIG
 DTS CONFIG
 PCM 44.1/48kHz CONFIG
 PCM 96kHz CONFIG

 BACK TO SURROUND SETUP
```

Figure 6

The LOGIC 7 GLOBAL line is the only item on this menu page that is menu-specific, and it allows you to select whether or not Logic 7 will be the default surround mode for any incoming audio signal. The default setting is OFF, which chooses the native mode. Press the ◀/▶ Navigation Buttons 14 G so that ON appears, to activate the global Logic 7 setting for this input.

The remaining five items in this menu each take you to a submenu listing the individual surround modes available within the selected mode group. To select a surround mode list, press the ▲/▼ Navigation Buttons 14 G until the on-screen cursor is pointing to the desired mode, and then press the Set Button 16 Q. Within each menu, press the ▲/▼ Navigation Buttons 14 G to move the cursor up and down through the list, and then press the ◀/▶ Navigation Buttons 14 G to turn the mode "ON" or "OFF."

- When a mode is ON, the mode will appear in all menu selections whenever you are changing the surround mode.
- When a mode is OFF, the mode will not appear and may not be selected for any source.
- Some modes (e.g., Dolby Digital, DTS and the Stereo mode in the PCM menus) should never be disabled.

A complete list of the AVR 445's surround modes is found on page 58, but here are some items that will help you decide which modes you want included in your setup, and which modes you may wish to turn off.

- The DOLBY MULTI CONFIG group contains the surround modes available when a multichannel Dolby Digital, encoded source is present. This includes both the discrete Dolby Digital modes, which cannot be turned off, as well as other modes which may be applied as post-processing on the source and system speaker configuration.
- The DOLBY 2.0 CONFIG group contains the surround modes available when a two-channel Dolby Digital-encoded source is present. This includes both the discrete Dolby Digital modes, which cannot be turned off, as well as other modes which may be applied as post-processing on the source and system speaker configuration.
- The DTS CONFIG group contains the surround modes available when a DTS-encoded digital source is present. This includes both the discrete DTS Digital mode, which cannot be turned off, as well as other modes which may be applied as post-processing on the source and system speaker configuration.
- The PCM 44.1/48kHz CONFIG group contains the surround modes available when a PCM digital data stream is present. This includes not only PCM sources from DVD or CD players, but also all two-channel analog sources that are in use, as they are converted to PCM within the AVR 445. The modes available include the proprietary Dolby modes (including Dolby Headphone and Dolby Virtual Speaker), DTS processing, our own Logic 7 modes, the conventional "DSP" modes (such as "Hall" and "Theater") and the "Stereo" modes.
- The PCM 96kHz CONFIG group contains the surround modes available when a PCM digital data stream is present. This includes not only 96kHz PCM sources from DVD or CD players, but also all two-channel analog sources when 96kHz is chosen in the ADC SAMPLING mode line in the SURROUND SETUP menu. Available modes include proprietary Dolby modes (including Dolby Headphone and Dolby Virtual Speaker), DTS processing, our own Logic 7 modes, the conventional "DSP" modes (such as "Hall" and "Theater") and the "Stereo" modes.

When all surround modes that are not required have been turned off, press the ▲/▼ Navigation Buttons 14 G until the on-screen cursor is pointing to BACK TO SURROUND CONFIG; then press the Set Button 16 Q.

The final item on the SURROUND SETUP menu is the DOLBY SURR SETUP line. When the on-screen cursor is at this line, press the Set Button 16 Q to bring the DOLBY SURROUND menu (Figure 7) up on the screen.

```
 * DOLBY SURR SETUP *

➔MODE: DOLBY PLIIx
       MUSIC
 CENTER WIDTH : 3
 DIMENSION: 0
 PANORAMA: OFF ON
 NIGHT: OFF MID MAX

 BACK TO SURROUND SETUP
```

Figure 7

With the exception of the Night mode setting, which is global and applies to all inputs, the settings on this page may be set individually for each input, but they are only active when the Dolby Pro Logic II or Dolby Pro Logic IIx Music modes are in use. Press the ◀/▶ Navigation Buttons 14 G to select the desired Dolby Pro Logic mode for adjustment, and then press the ▲/▼ Navigation Buttons 14 G to move through the three choices. Press the ◀/▶ Navigation Buttons 14 G to adjust the settings, as desired.

The three Dolby surround settings are:

- 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 presentatioin.
- 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 "O" 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 to ON to add an enveloping presentation that increases the perception of sound along the sides of the room.

When any needed adjustments to the parameter settings for the Dolby Pro Logic II and Dolby Pro Logic IIx Music modes have been made, or if no adjustment to those settings are required, press the ▲/▼ Navigation Buttons 14 G to move to the last line on the menu.

The NIGHT line adjusts the settings for the Night mode, which is only available when specially encoded Dolby Digital sources are being played.

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.

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To adjust the Night mode setting, make certain that the cursor is on the NIGHT line of the DOLBY menu. Next, press ◀/▶ Navigation Buttons 14G to choose between the following settings, as they appear in the on-screen display:

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

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

MAX: When MAX is shown, 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.

When all settings on the DOLBY SURR SETUP menu are compete, press the ▲/▼ Navigation Buttons 14G until the cursor is next to BACK TO SURROUND SETUP and press the Set Button 16Q. You may then make any additional changes to the available options from that screen, or use ▲/▼ Navigation Buttons 14G to move the cursor to the BACK TO SURROUND CONFIG menu; press the Set Button 16Q again to back up one menu.

At the main SURROUND SETUP menu, you may change the SOURCE to make adjustments to another input, or when all input sources have been configured, use ▲/▼ Navigation Buttons 14G to move the cursor to the BACK TO MASTER MENU and press the Set Button 16Q to return to the main menu so that you may move to the next step in configuring your AVR 445.

Using EzSet/EQ

The AVR 445 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 proprietary algorithms and configurable digital filters to deliver 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 properties 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 28–33.

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 hard surface and adjust it so that microphone is at or above ear level. If you do not have a tripod, simply screw the extender 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.

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

Step 1. Navigate to the EZSET/EQ MAIN menu (Fig. 8) by first pressing the OSD Button 31B on the remote. Press the ▼ Navigation Button 14G until the cursor is pointing to EZSET/EQ in the MASTER MENU. Press the Set Button 16Q to bring the new menu to the screen.

```
  * EZSET/EQ MAIN *

  Select activity:

→ AUTOMATIC EQ DESIGN
  MANUAL EQ DESIGN
  EZSET/EQ MANUAL SETUP

  BACK TO MASTER MENU
```

Figure 8

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 16Q, as the cursor is already pointing to AUTOMATIC EQ DESIGN when the menu appears on the screen. Then press the Set Button 16Q again when the AUTOMATIC EZSET/EQ menu appears, to continue to Step 3.
- If you wish to enter the speaker size or 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 14G to point the cursor to EZSET/EQ MANUAL SETUP and then press the Set Button 16Q. Once the EZSET/EQ MANUAL SETUP menu (Fig. 18) appears, follow the instructions on page 29 to enter your desired settings for the speaker size or Crossover Frequencies, and then return to the EZSET/EQ MAIN menu. Press the ▼ Navigation Button 14G again so that the cursor is pointing to MANUAL EQ DESIGN and then press the Set Button 16Q. 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 16Q again since you have already set the crossovers.

Step 3. The FAR FIELD MEASURE screen (Figure 9) 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 18H to adjust the volume level to –35dB, as shown on the line that appears at the bottom of the menu when the volume is adjusted. Press the Set Button 16Q when the volume is set to the proper level.

```
  * FAR FIELD MEASURE *
  Place mic at ear level
  near the listening
  position at least 3ft/
  1m from any hard
  surface.
  Set volume to -35dB
→  CONTINUE
   BACK TO EZSET/EQ MAIN
   BACK TO MASTER MENU
     VOLUME: -35dB
```

Figure 9

Step 4. The final menu screen before the EzSet/EQ process starts is a warning screen (Figure 10) 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 form 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. If you do not wish to start the test process at this time, press the ▲/▼ Navigation Button 14G to return to either the EZSET/EQ MAIN menu or the MASTER MENU, and press the Set Button 16Q. To begin the EzSet/EQ Near Field measurements, press the ◀/▶ Navigation Button 14G so that ON is highlighted, and press the Set Button 16Q.

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.

```
        WARNING !!

During measurement,
please maintain silence
while several sound
bursts are heard.

→START : OFF ON
BACK TO EZSET/EQ MAIN
```

Figure 10

Step 5. At this point, a series of test tones will circulate among all the speakers in your system. While this is happening, the AVR 445 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 tones stop, the system will pause for as long as a minute while the processor makes its calculations based on the results of the signal measurements. 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.

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 carefully to make sure that the test tone circulates in a clockwise rotation, starting with the front left speaker, to the center, to the front right, and so on to the subwoofer. If the tone is heard from a speaker that seems as though it is out of sequence, such as the tone coming from the surround left speaker when the next speaker in the sequence should be the surround right speaker, exit the EzSet/EQ system when the test sequence is completed and use the manual output level tone adjustment process, as outlined on page 31, to determine which, if any, speaker is incorrectly connected.

When the test process stops, you will see a message indicating that the Far Field measurements are complete. If there is an error, follow the instructions in Step 7a or Step 7b.

Step 6. When the Far Field tests are complete, a message screen will appear to indicate whether the procedure was successful or not. In most cases, there will not be any problems and you will see the message shown in Figure 11 on your screen.

```
* FAR FIELD COMPLETE *
      EQ successful.
Speaker config detected

 FL  : YES   SBR: YES
 CEN : YES   SBL: YES
 FR  : YES   SL : YES
 SR  : YES   SUB: YES

→DO NEAR FIELD
 BACK TO MASTER MENU
```

Figure 11

If the speaker positions shown match the actual speaker layout in your system, confirm that the cursor is pointing to **DO NEAR FIELD** and press the **Set Button 16 Q** to take the Near Field measurements from the front left, center and right speakers. Continue these instructions with Step 8.

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 12. 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 the menus and turn the receiver off. Check all speaker wire connections and then rerun EzSet/EQ.

```
* FAR FIELD EQ ERROR *
Detected speaker config

 FL  : YES   SBR: NO
 CEN : YES   SBL: YES
 FR  : YES   SL : YES
 SR  : NO    SUB: YES

Verify spkr connections
Verify mic position
Reduce background noise

→BACK TO MASTER MENU
```

Figure 12

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 13. If you see this message, verify that the microphone is in the correct position, and is not too close to any one speaker. Then press the **Set Button 16 Q** 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.

```
   * EZSET/EQ ERROR *

An overload was
detected. Please
verify mic position.
Reduce the volume by
6dB and repeat the
procedure.

→BACK TO MASTER MENU
```

Figure 13

Step 8. When the Far Field measurements are completed, the next step is to take three Near Field measurements, one at each front speaker position. These measurements enable EzSet/EQ to produce the most accurate settings for high-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 14) that should be on your screen after completing the instructions in Step 6, press the **Set Button 16 Q** to start the near field measurements with the front left speaker. If you are repeating the setup process, you may also use the **▲/▼ Navigation Buttons 14 G** to select any of the three speaker positions shown.

```
* NEAR FIELD EQ SELECT *

      Please select

→1. FL Speaker
 2. CEN Speaker
 3. FR Speaker

 BACK TO MASTER MENU
```

Figure 14

At the **NEAR FIELD MESSAGE** menu, 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 2 feet. The top of the microphone should be pointed toward the speaker, rather than pointing up as was done for the Far Field tests. Press the **Set Button 16 Q** to continue.

Step 9. You will now see a **WARNING** message similar to the one shown in Figure 10 except that it will contain an option to return to the **NEAR FIELD EQ SELECT** menu (Figure 14) 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, at a distance of about 2 feet. Press the **▶ Navigation Button 14 G**

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so that ON is highlighted and then press the Set Button 16 Q.

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 (Figure 15) or a NEAR FIELD ERROR message (Figure 16). 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 15 will appear. 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 toward BACK TO NEAR FIELD and press the Set Button 16 Q. You will return to the NEAR FIELD EQ SELECT menu (Figure 14), 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. Press the ▼ Navigation Button 14 G to return to the MASTER MENU.

```
 * NEAR FIELD COMPLETE *

 EZSET/EQ has success-
 fully performed
 Near Field EQ for
 the selected speaker.

→BACK TO NEAR FIELD
 BACK TO MASTER MENU
```

Figure 15

Step 12. If a NEAR FIELD ERROR message appears, as shown in Figure 16, make certain that the microphone is about 2 feet from the speaker being tested and that the top of the microphone unit is pointing toward 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 16 Q. This will return you to the NEAR FIELD EQ SELECT menu (Figure 14) where you should repeat Steps 8 through 11, adjusting the mike placement and volume level as needed until the NEAR FIELD COMPLETE menu (Figure 15) appears after the test tone stops.

```
 * NEAR FIELD ERROR *

 Near Field EQ was not
 successful.

 Please check mic
 placement and volume
 setting

→BACK TO NEAR FIELD
 BACK TO MASTER MENU
```

Figure 16

When the 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 34 for complete information on operating your AVR 445.

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 445 also allows you to enter or trim any of these 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 change.

To view or change the current settings, press the OSD Button 31 B on the remote to bring up the MASTER MENU (Figure 1). Next, press the ▼ Navigation Button 14 G as needed until the cursor is on the EZSET/EQ line, and press the Set Button 16 Q. Navigate to the EZSET/EQ MANUAL SETUP line. Press the Set Button 16 Q to view the EZSET/EQ MANUAL SETUP menu (Figure 17).

```
 * EZSET/EQ MANUAL SETUP *

→ EZSET EQ : OFF ON
  EZSET ADJUST
  SPEAKER SIZE
  DELAY ADJUST
  CHANNEL ADJUST

  BACK TO EZSET/EQ MAIN
```

Figure 17

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 14 G so that OFF is highlighted. 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. To adjust the tilt setting, make sure that the cursor is on the EZSET ADJUST line, and press the Set Button 16 Q. Then press the ◀/▶ Navigation Button 14 G to enter the desired setting. When you have completed your adjustment, press the ▶ Navigation Button 14 G to move the cursor down to the BACK TO MANUAL SETUP line and press the Set Button 16 Q.

Note on Manual Setup Menus: Each manual setup menu (Speaker Size, 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 14 G until the cursor is on the EZSET SETTINGS line on the menu in use and press the ◀/▶ Navigation Button 14 G to change the setting to OFF. This will allow you to make changes to the settings on that menu.

Speaker Size Menu

Although most listeners will prefer to take advantage of the accuracy and speed of EzSet/EQ to make all of the necessary speaker adjustments, advanced users may wish to experiment with how different combinations of settings sound in their home theater environment or to use settings other than those calculated by EzSet/EQ, to accommodate personal listening preferences.

The menu system used in your AVR 445 differs somewhat from conventional speaker setup menus in that it consolidates the speaker "size" and crossover into one convenient menu. Even if you are familiar with making these adjustments, it is strongly recommended that you read the following section of this manual.

On the SPEAKER SIZE menu (Figure 18) you have the option to change the type of speaker configured for each of the four position groups, to change the crossover setting for any one of those speakers, to adjust the setting point for the low-pass filter that determines which frequencies are sent to the subwoofer for low-frequency effects (LFE) signals, to change the subwoofer bass redirection mode when the Front Left/Right speakers are set to Large and to change the setting for the subwoofer size. If, as recommended, you have first run the EzSet/EQ system, as shown on pages 26–28, the settings established by EzSet/EQ will be displayed as a starting point for any manual adjustments. You may reestablish those settings at any time during an adjustment on this menu by pressing the ▲/▼ Navigation Button 14 G until the cursor is on the EZSET SETTINGS line of the menu and then pressing the ◀/▶ Navigation Button 14 G so that ON is highlighted in reverse video. Note, however, that once this is done, any manual adjustments made will be lost and must be reentered.

Speaker Size

At each of the four speaker group positions, you have the ability to select the speaker "size" and, when a "Small" speaker is selected, the frequency below which low-frequency information is sent to the subwoofer, as opposed to the speakers for the channel being adjusted. For that reason, before making the adjustments on the FRONT L/R, CENTER, SIDE SURR and BACK SURR menu lines, it is important to know the frequency range for the speaker. This information is typically found in the "Specifications" section of the speaker's owner's manual. If you cannot find the specification for the lowest frequency the speaker can handle, start with the settings entered by running EzSet/EQ and then try one setting above or below the existing entry. We do not recommend changing the crossover point more than that due to the possible impact that will have on the speaker's performance. If you do not have access to the owner's manual for a particular speaker, you should be able to obtain the needed information from the Web site or customer service department of the speaker's manufacturer.

To manually adjust the speaker settings, go to the SPEAKER SIZE menu by pressing the OSD Button 31 B on the remote and when the MASTER MENU (Figure 1) appears, press the ▲/▼ Navigation Button 14 G until the cursor is on the EZSET/EQ line and press the Set Button 16 Q. Navigate to the EZSET/EQ MANUAL SETUP line and press the Set Button 16 Q. When the EZSET/EQ MANUAL SETUP menu (Figure 17) appears, press the ▲/▼ Navigation Button 14 G again until the cursor is on the SPEAKER SIZE line and press the Set Button 16 Q.

On the SPEAKER SIZE menu (Figure 18) you will see a display of either the settings that were established when EzSet/EQ was run, or the factory default settings if you have not yet run the automated system.

```
    * SPEAKER SIZE *

→ FL/FR       :SM - 100Hz
  CENTER      :SM - 100Hz
  SL/SR       :SM - 100Hz
  SBL/SBR     :SM - 100Hz MULTI
  LFE LP FLT  :120Hz
  SUB MODE    :SUB
  SUB SIZE    :10in/250mm
  EZSET SETTINGS: OFF  ON

  BACK TO MANUAL SETUP
```

Figure 18

To change the setting for any of the four speaker positions, press the ▲/▼ Navigation Button 14 G until the cursor points to the line where you wish to make the change. Press the ◀/▶ Navigation Button 14 G to change the setting, but note that when you do this for the first time in the menu, a warning message (Figure 19) will appear in the on-screen display reminding you to rerun EzSet/EQ after you are finished with any speaker configuration changes. This is necessary to make any level output adjustments needed after the setting changes so that the new configuration will be properly integrated.

```
* X-OVER CHANGE WARNING *

Speaker X-over Freq or
Size has been changed.

Please re-run EZSET/EQ
```

Figure 19

The warning message will remain for a few seconds and then the SPEAKER SIZE menu will return to the screen. At this point you may change the settings to the "size" or crossover for any of the four speaker positions using the Navigation Buttons 14 G as shown above. The information below details the settings available for each of the speaker configurations.

At each of the four speaker position lines, you have the option to set the speaker size and crossover. Note that the "size" does not refer to the speaker's actual physical size, but rather to the ability of the speaker to reproduce low-frequency information. If your speakers at any position are traditional full-range models capable of handling the full audio spectrum, select LARGE. These speakers are called "large" since the low-frequency drivers required to play bass without strain or distortion are typically eight to fifteen inches in diameter, in turn making the speaker cabinet larger than those with small (or no) low-frequency drivers. When the speakers at a particular position are smaller frequency-limited speakers that do not have the ability to properly reproduce low-frequency sounds, select SMALL.

At all speaker positions except for the front left/right speakers, you may also select NONE. This setting tells the system that no speakers are present at that 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 entered as the setting for the BACK SURR channels.

When LARGE is selected for any channel, a full-range signal will be sent to the speaker outputs for that channel. For all speaker positions except the front left/right, when LARGE is chosen, no derived sound will be sent to the subwoofer output, although in all cases the special low-frequency effects (LFE) signals available on 5.1 or 6.1 digital programs will always be sent to the subwoofer output.

When SMALL is selected for any channel, you may also enter a setting for the crossover frequency at which sound is divided between the frequency above which sound is sent to the channel's speakers and below which sound is sent to the subwoofer. When configuring a "small" speaker, choose the setting that has the frequency closest to that of the lowest frequency the speakers in question are capable of handling. If one of the six available crossover points does not match, select the one that is above, but closest to, the speaker's low-frequency limit.

SYSTEM CONFIGURATION

When there are no speakers available at a specific position, select NONE. When this option is chosen for the Center or Side Surround speakers, the sound that would normally be sent to these channels will be split between the front left and right speakers. Note that when your system does not include Center or Surround speakers, the use of Dolby Virtual Speaker as a surround mode may provide a sound field that simulates the presence of these speakers. (See the appendix for more information on the Dolby Virtual Speaker mode.)

Note that when NONE is selected for the Back Surround speakers, the 6.1/7.1 channel surround modes are not available. When this is the case for your system, you may wish to take advantage of the availability of the unused amplifier channel pair to power a second set of speakers in another room. (See page 44 for more information on amplifier configuration.)

Once any desired changes have been made to the speaker size and/or crossover, press the ▲/▼ Navigation Button 14 G to move the cursor to any other line on this menu to make a setting change, or go to the BACK TO MANUAL SETUP menu and then press the Set Button 16 Q to continue with overall configuration.

LFE Low-Pass-Filter Setting

The LFE LP FLT line selects the frequency setting below which sounds that may be available from a special low-frequency effects (LFE) track are sent to the subwoofer. In most cases, this setting will be set accurately by EzSet/EQ but, should you wish to make a change from that setting or the 120Hz frequency that is most commonly used in the creation of LFE channels by motion picture sound mixers, after making sure that the SPEAKER SIZE menu (Figure 18) is on the screen, press the ▲/▼ Navigation Button 14 G so that the cursor is pointing to LFE LP FLT. Press the ◀/▶ Navigation Button 14 G to begin the selection process, and note that a warning message will appear, reminding you to rerun EzSet/EQ after all changes have been made.

When the SPEAKER SIZE menu returns to the screen, press the ◀/▶ Navigation Button 14 G to make your selection. When the desired setting appears, press the ▲/▼ Navigation Button 14 G to move the cursor to any other line on this menu where you wish to make a setting change, or go to the BACK TO MANUAL SETUP menu and then press the Set Button 16 Q to continue with overall configuration.

Sub Mode Setting

When the Front Left/Right speakers are configured as "Large" and a subwoofer is detected by EzSet/EQ or manually configured as being available, additional options are available to further customize bass redirection. To change these settings, first make sure that the SPEAKER SIZE menu (Figure 18) is on the screen, and then press the ▲/▼ Navigation Button 14 G so that the cursor is pointing to SUB MODE. Press the ◀/▶ Navigation Button 14 G to begin the selection process, and note that a warning message will appear, reminding you to rerun EzSet/EQ after all changes have been made.

The following options are available:

- The default setting for Large front left/right speakers when a subwoofer is present is SUB L/R + LFE. In this mode, all sounds below the crossover point set on the LFE LP FLT line will be sent to BOTH the subwoofer and the front left/right speakers.
- To send only the LFE channel information to the subwoofer, but have all other ("derived") low-frequency sounds sent to the front left/right speakers, select the SUB (LFE) setting.
- To have low-frequency information sent to the subwoofer only when Large speakers are selected, choose SUB (L/R). This option is only available when the unit is set to SURROUND OFF so that a pure analog audio path is provided.
- When no subwoofer is present and Large speakers are configured for the front left/right position, select NONE. This will route all low-frequency information to the front left/right speakers.

When the SPEAKER SIZE menu returns to the screen, replacing the warning message, press the ◀/▶ Navigation Button 14 G to make your selection. When the desired setting appears, press the ▲/▼ Navigation Button 14 G to move the cursor to any other line on this menu where you wish to make a setting change, or go to the BACK TO MANUAL SETUP menu and then press the Set Button 16 Q to continue with overall configuration.

Subwoofer Size

The final setting on the SPEAKER SIZE menu enables you to change the setting for the subwoofer size. In the event that EzSet/EQ did not accurately enter the correct size, or if you wish to experiment with a different setting, first make sure that the SPEAKER SIZE menu (Figure 18) is on the screen; then press the ▲/▼ Navigation Button 14 G so that the cursor is pointing to SUB SIZE and then press the ◀/▶ Navigation Button 14 G to begin the selection process. Note that a warning message will appear for 4 seconds to remind you to rerun EzSet/EQ after all changes have been made.

Select a setting that best matches the diameter of your subwoofer's driver, or which provides the appropriate high-pass filter setting for your system. In each case, the frequency of the high-pass filter determines the frequencies below which no information is sent to the subwoofer:

- The setting for an 8-inch/200mm driver activates a 38Hz subwoofer high-pass filter.
- The setting for a 10-inch/250mm driver activates a 30Hz subwoofer high-pass filter.
- The setting for a 12-inch/305mm driver activates a 20Hz subwoofer high-pass filter.
- The setting for a 15-inch/380mm driver activates a 15Hz subwoofer high-pass filter.

When all changes to speaker-related settings have been made, press the ▲/▼ Navigation Button 14 G until the cursor is on the BACK TO MANUAL SETUP menu; then press the Set Button 16 Q so that you may make any other adjustments to the system parameters. Remember to rerun the EzSet/EQ system if any changes have been made to the settings on this menu, following the instructions for using the Manual mode shown on page 26.

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 han 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 445 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 scalers, digital cable or satellite systems, or digital video recorders. With proper adjustment of the setting for A/V Sync Delay, you can eliminate the loss of lip sync that may be introduced when video signals are digitized.

To make any changes to the delay settings, go to the DELAY ADJUST submenu within the EZSET/EQ MANUAL SETUP menu (Figure 17). To do this, first press the OSD Button 31 B so that the MASTER MENU (Figure 1) appears. Next, press the ▲/▼ Navigation Button 14 G until the cursor is on the EZSET/EQ line and press the Set Button 16 Q. Navigate to EZSET/EQ MANUAL SETUP and then press the Set Button 16 Q. When the MANUAL SETUP menu is shown, press the ▲/▼ Navigation Button 14 G again until the cursor is on the DELAY ADJUST line and press the Set Button 16 Q to view the DELAY ADJUST menu (Figure 20).

```
    * DELAY ADJUST *

→ FL :12.0ft  SBR:10.0ft
  CEN:12.0ft  SBL:10.0ft
  FR :12.0ft  SL :10.0ft
  SR :10.0ft  SUB:12.0ft
  DELAY RESET: OFF ON
  UNIT: FEET METER
  EZSET SETTINGS  : OFF ON

  BACK TO MANUAL SETUP
```

Figure 20

Once the DELAY ADJUST menu is on your screen, note that the default for distance settings 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 14 G until the on-screen cursor is at the UNIT line on the menu. Then, press the ◀/▶ Navigation Button 14 G so that METER is highlighted. When the change in measurement units is made, press the ▲/▼ Navigation Button 14 G to return the cursor to the FL position.

If you wish to reset all delay settings to the factory defaults, as shown in Figure 20, press the ▲/▼ Navigation Button 14 G until the cursor is pointing to the DELAY RESET line. Next, press the ◀/▶ Navigation Button 14 G so that ON is highlighted. The settings will reset, and you may now continue to make any needed changes, following the instructions shown below. Once you make the first change to the default settings, the setting on the DELAY RESET line will return to OFF, indicating that the factory defaults are no longer in effect.

To change the setting, first make sure that the on-screen cursor is pointing to FL, and press the ◀/▶ Navigation Button 14 G until the distance from the center speaker to the preferred listening position is entered. Next, press the ▼ Navigation Button 14 G to move the cursor to the next line and use the ◀/▶ Navigation Button 14 G 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 14 G to change to the next position; then use the ◀/▶ Navigation Button 14 G 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 30, 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.

If you have already run EzSet/EQ, return to the settings established by the automated system by pressing the ▲/▼ Navigation Button 14 G until the cursor is pointing to the EZSET SETTINGS line. Next, press the ◀/▶ Navigation Button 14 G so that ON is highlighted in reverse video. The settings will be resent to the values calculated by EzSet/EQ, and the menu will be locked so that the settings may not be changed. To go back into the menu and make any manual changes to one or more channels, you must first return the cursor to the EZSET SETTINGS line and press the ◀/▶ Navigation Button 14 G so that OFF is highlighted in reverse video. This will unlock the menu to allow changes.

When the delay time for all speaker positions has been set, you may return to manual setup by pressing the ▲/▼ Navigation Button 14 G until the cursor is pointing to BACK TO MANUAL SETUP; then press the Set Button 16 Q.

The delay settings may also be adjusted at any time using the main remote control and while viewing an on-screen image by pressing the Delay Select Button 36. The A/V Sync Delay setting is first, and it may be adjusted by pressing the Set Button 16 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 14 to enter the desired delay setting that brings the video and sound back in sync. Press the Set Button 16 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 37, followed by the ▲/▼ Navigation Button 14 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 16 within 5 seconds. Press the ◀/▶ Navigation Button 14 to enter the desired delay setting for that speaker and then press the Set Button 16 to enter the setting. The ▲/▼ Navigation Button 14 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 14 G until the cursor is on the BACK TO MANUAL SETUP menu and then pressing the Set Button 16 Q 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 B 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 445, 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.

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.

SYSTEM CONFIGURATION

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 changes to the channel output settings, go to the CHANNEL ADJUST submenu within the EZSET/EQ MANUAL SETUP menu (Figure 17). To do this, first press the **OSD Button** 31 B so that the MASTER MENU (Figure 1) appears. Next, press the ▲/▼ **Navigation Button** 14 G until the cursor is on the EZSET/EQ line, and press the **Set Button** 16 Q. Navigate to EZSET/EQ MANUAL SETUP and press the **Set Button** 16 Q. In the EZSET/EQ MANUAL SETUP menu, press the ▲/▼ **Navigation Button** 14 G again until the cursor is on the CHANNEL ADJUST line; then press the **Set Button** 16 Q to view the CHANNEL ADJUST menu (Figure 21).

```
  * CHANNEL ADJUST *
→ FL :  0dB     SBR:  0dB
  CEN:  0dB     SBL:  0dB
  FR :  0dB     SL :  0dB
  SR :  0dB     SUB:  0dB
  TEST TONE  : AUTO OFF MAN
  LEVEL RESET: OFF  ON
  CH ADJUST: GLOBAL
  EZSET SETTINGS: OFF ON

  BACK TO MANUAL SETUP
```

Figure 21

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** 14 G again until the cursor is on the TEST TONE line and then press the ◀/▶ **Navigation Button** 14 G 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 445 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 445 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** 14 G on the remote to bring all speakers to the same volume level. When the ◀/▶ **Navigation Button** 14 G 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** 14 G on the remote control 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** 14 G until the cursor is next to the BACK TO MANUAL SETUP line, and then press the **Set Button** 16 Q to return to the EZSET/EQ MANUAL SETUP 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 circulate the tone manually, first make certain that the CHANNEL ADJUST menu is on the screen, following the instructions shown above, and then press the ▲/▼ **Navigation Button** 14 G until the cursor is on the TEST TONE line. Next, press the ◀/▶ **Navigation Button** 14 G until MANUAL appears. 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, you must press the ▲/▼ **Navigation Button** 14 G 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 output level adjustment using the menu system does not use the internal test tone at all. To do this, simply use the ▲/▼ **Navigation Button** 14 G to change the channel and then use the ◀/▶ **Navigation Button** 14 G 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** 14 G until the desired level is shown in the display or on the 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.

In addition to the controls for selecting channels and the test tone operation, the settings on this menu also allow you to reset the level settings to either the factory default of 0dB or to reestablish the settings that were entered by running EzSet/EQ.

To reset all channel levels to 0dB, press the ▲/▼ **Navigation Button** 14 G so that the cursor is pointing to the LEVEL RESET line and then press the ▲/▼ **Navigation Button** 14 G once so that ON appears in highlighted video.

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 the ▲/▼ **Navigation Button** 14 G so that the cursor is pointing to the EZSET SETTINGS line and then press the ◀/▶ **Navigation Button** 14 G once so ON appears in highlighted video. Remember that after turning the EzSet/EQ settings back on you must return to this menu line and change the setting to OFF if you wish to make any manual trim adjustments.

The last setting in this menu enables you to 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 channel, 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 B 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 Selector** 7 on the front panel or the buttons on the remote that are used to select an input source 4 5 34 44 C D E F R. Next, return to the CHANNEL ADJUST submenu using the steps outlined above.

At the CHANNEL ADJUST menu, press the ▲/▼ **Navigation Button** 14 G until the cursor is pointing to the CH ADJUST line and then press the ◀/▶ **Navigation Button** 14 G 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.

NOTE: With the default GLOBAL setting, output levels are associated with the various surround modes. As you spend time listening to various materials and selecting a variety of surround modes, you may wish to revisit the CHANNEL ADJUST menu to set the output levels.

When all changes to the Channel Output levels and the associated level trim settings have been made, press the ▲/▼ **Navigation Button** 14 G until the cursor is on the BACK TO MANUAL SETUP menu and then pressing the **Set Button** 16 Q 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 B 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 IN/OUT 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 445 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 42 and 43 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 445, 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, the AVR 445 is simple to operate and enjoy. The following instructions will help you maximize the enjoyment of your new receiver:

Turning the AVR 445 On or Off

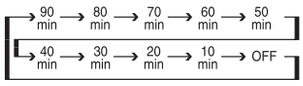
- When using the AVR for the first time, you must press the **Main Power Switch A** in until it latches. This places the unit in a Standby mode, as indicated by the amber illumination surrounding the **Standby/On Switch 1**.
- To turn the AVR on or off from the front panel, press the **Standby/On Switch 1**.
- To turn the unit on and select the input source that was in use the last time the AVR was on, press the **AVR Selector 5 C** on either remote.
- To turn the unit on and select a specific source, press any one of the **Input Selectors 4 34 44** on the main remote or **D E F R** on the ZR 10 remote .
  - When using the **Input Selector Buttons 4** labeled DVD, DMP, XM or HDMI on the main remote, remember that these are dual-input selectors. The first press of any button will turn the unit on and select the input name printed on the button. A second press of the button will select the input name printed above the button.
  - To turn the AVR on and select the Tuner as an input, press the **Tuner/FM Select Button 34** by pressing the button up towards the top of the remote. The first press of the button selects the frequency band and station or XM channel that was last tuned. Press the button again to select between FM, AM and XM.
  - To turn the AVR on and select the FM tuner as the input, press the **Tuner/FM Select Button 34** down towards the bottom of the remote.
  - When using any of the Input Selectors to turn the unit on (or when using them to change a source at any time) press the **AVR Selector 5 C** after the unit turns on to use any of the buttons on the remote to control AVR functions other than volume or source selection.

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.

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 17** 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 put the AVR in the Sleep mode, press the **Sleep Button 29**. Each press of the button will decrease the time before the AVR shuts down in the following sequence.



Once you have set the desired Sleep Time, the front-panel display will automatically dim to half-brightness. The display will return to full-brightness when any button on the front panel or a remote is pressed, and then return again to half-brightness. To view the time remaining until the unit shuts down, press the **Sleep Button 29** once. To cancel the Sleep function, press the **Sleep Button 29** as many times as needed until the words SLEEP OFF 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 an input source from the front panel, press the **Input Source Selector Button 7**. Each press of the button will move the input selection through the list of available choices. If the button is pressed when the AVR is in the Standby mode, the first press of the button will turn the unit on and select the last used input.
- When the AVR is already turned on, you may select the tuner directly by pressing the **Tuner Band Selector 5**. The first press will select the last tuned frequency band and station. Each subsequent press will change the band to the last tuned station or XM preset.
- To select a specific source using the main remote, press any one of the **Input Selectors 4 34 44** on the main remote. Remember that the Input Selector Buttons labeled DVD, DMP, XM or HDMI are dual-input selectors. The first press of any button will turn the unit on and select the input name printed on the button. A second press of the button will select the input name printed above the button.
- To directly select the Tuner as an input, press the **Tuner/FM Select Button 34** by pressing the button up towards the top of the remote. The first press of the button selects the frequency band and station or XM channel that was last tuned. Press the button again to select between FM, AM and XM.
- To directly select the FM tuner as the input, press the **Tuner/FM Select Button 34** down towards the bottom of the remote.
- To select a specific source using the ZR 10 remote, press any of the **Input Selectors D E F R**. When selecting the Tuner as the input, each press of the **Tuner Selector E** scrolls through the choice of FM, AM or XM Radio (when an optional XM Ready module is installed and the XM service has been activated).

REMINDER: When using any of the Input Selectors to change a source, you must press the **AVR Selector 5 C** to control AVR functions other than volume or source selection.

- 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.
- The front-panel **Video 4 Inputs N**, **Optical 4 Digital Input K** or **Coaxial 4 Digital Input L** may be used to connect a device such as a video game or camera 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 (except when HDMI, 720p or 1080i sources are in use). 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 Monitor Outputs 26 29**. This permits simultaneous viewing and listening to different sources.

6-Channel/8-Channel Direct Input

There are four input choices available for use with sources such as DVD-Audio SACD player or HD-DVD or Blu-ray disc player that are connected to the **8-Channel Direct Inputs 39**. 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 6 CH DVD AUDIO input should be used when the SBR and SBL inputs are NOT in use *and* when the input source does NOT have its own

internal bass-management system. When this input is in use, the analog source is converted to digital so that you may use the same bass-management options for the direct input as are used for all other inputs. This input also 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** 39 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.
- The 8 CH DVD AUDIO input should be used when an input is connected to all eight **8-Channel Direct Inputs** 39 and when the input source does not have its own internal bass-management system. When this input is in use, the analog source is converted to digital so that you may use the same bass-management options for the direct input as are used for all other inputs.

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 H.
- To temporarily silence all speaker outputs, press the **Mute Button** 45 S. 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 (except when HDMI, 720p or 1080i sources are in use) and in the **Upper Display Line** 13; press the **Mute Buttons** 45 S 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** C 32. The first button press will show a message in the on-screen display (except when HDMI, 720p or 1080i sources are in use) 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 Buttons** 14 G on the remote control or the ◀/▶ **Buttons** 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 up to ±10dB in 2dB steps by pressing the **Tone Mode Button** C 32 two or three times until the desired setting (BASS MODE or TREBLE MODE) appears in the on-screen display and in the **Lower Display Line** 14. Next, use the ◀/▶ **Navigation Buttons** 14 G on the remote or the ◀/▶ **Navigation Buttons** on the front panel H to change the setting as desired. The unit will return to normal operation within five seconds after the setting is changed.
- For private listening, simply place a standard 1/4" stereo headphone plug or adapter into the **Headphone Jack** B 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. To listen through the headphones using the Dolby Headphone mode, simply press the buttons on the remote or front panel as shown below for changing a Dolby mode. DOLBY H: DH will appear in the Lower Display Line when the Dolby Headphone mode is in use.

Surround Mode Selection

One of the most important features of the AVR 445 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 (e.g., Dolby 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-TV 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 Dolby Pro Logic II, Dolby Pro Logic IIx, 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 choose a surround mode using the remote, first press the button for the major surround mode group that includes the desired mode. These buttons are the **Dolby Mode Select** 43, the **DTS Digital Model Select** 42, the **DTS Neo:6 Mode Select** 41, the **DSP Surround Mode Select** 7 and the **Stereo Mode Select** 40 buttons. The first press of a 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, the on-screen display (when a 480i source is in use) and 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 445 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 external 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 a 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 two-channel 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 445 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 the default format for DVD discs and for the (ATSC) high-definition system used in the United States and Canada. It is also used by the digital satellite program services and is available on most digital cable set-top boxes. When the AVR 445 is connected to a blue-laser-based high-definition optical disc player via a coaxial or optical digital audio connection, the soundtrack may be available in the standard Dolby Digital or DTS format so that it may be decoded by the AVR.

An optional, external RF demodulator is required to use the AVR 445 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** **K L** 37 38 of the AVR 445. A demodulator is not required for use with high-definition optical disc or DVD players, or with DTS-encoded laser discs.

In order to provide maximum playback compatibility with DVDs, the AVR 445 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 on to the incoming digital audio data stream:

- When a Dolby Digital 5.1 data stream is detected, the choice of which surround mode is activated is determined by the setting on the DEFAULT SURR line of the SURROUND SETUP menu (Figure 5), as shown on page 24.
- When a disc with the Dolby Digital EX flag is played, your system will automatically switch to the EX mode when seven main speakers are available.
- When a disc with 2.0 Dolby Digital data is detected, the default mode is Dolby Digital with Pro Logic II postprocessing when you have a 5.1 speaker system, or Dolby Digital with Dolby Pro Logic IIx postprocessing when you have a 7.1 speaker system.
- Depending on the number of speaker channels available in your system, once the AVR locks on to the digital signal, you may select any surround mode or postprocessing 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 postprocessing such as Logic 7/7.1-channel Movie mode postprocessing 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 445. All that is required is to connect the player's output to either an **Optical** or **Coaxial Input** on the rear panel 37 38 or front panel **K L**.

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. If you are in doubt as to the capability of your DVD player to handle DTS discs, consult the player's owner's manual.

When the AVR 445 is connected to a blue-laser-based high-definition optical disc player via an HDMI, coaxial or optical digital connection, the soundtrack from the player is also available in the standard DTS format so that it may be decoded by the AVR.

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.
- When selecting surround modes, any mode where the setting in its mode group (Dolby, DTS, Logic 7, PCM, etc.) has been set to OFF in one of the SURROUND CONFIG menus will not appear and may not be selected. You may change the settings in this list at any time by following the instructions on pages 24–25.

Selecting a Digital Source

To utilize either digital mode, you must have properly connected a digital source to the AVR 445. Connect the digital outputs from DVD players, HDTV receivers, satellite systems or CD players to the **Optical** or **Coaxial Inputs** **K L** 37 38. 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 445 rear panel (e.g., connect the analog stereo audio output from a DVD to the **DVD Audio Inputs** 36 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 22, first select the input using the remote or front-panel controls, as outlined in this manual. Next, press the **Digital Select Button** 15, then press the ◀/▶ **Navigation Buttons** 14 G 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 445 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 for the IN/OUT SETUP menu (Figure 2), as shown on page 22.

Digital Bitstream and Surround Mode Indications

When a digital source is playing, the AVR 445 senses the type of bitstream data that is present, and automatically selects the proper surround mode. 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 445 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 445 will display a message to indicate the type of bitstream being received. It will remain in the **Lower Display Line 14** for about 5 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/.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, Dolby Digital EX and DTS 5.1 or DTS-EX 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 and DTS 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 on the right side of the display will tell you whether 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 7/7.1 or Dolby Pro Logic IIx to add rear channels for full 7.1 sound fields. Note, however, that the availability of specific modes for postprocessing is dependent on the format of the incoming source material. While some combinations (e.g., a Dolby Digital or DTS 5.1 source with Logic 7/7.1 or Dolby Pro Logic IIx postprocessing) 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.

NOTE: When an HDMI-equipped video display is in use, regardless of the type of source and whether or not it is connected through the AVR 445, it communicates with the source device using a technology called "EDID" so that the capabilities of the source and display are properly matched. In some cases, this may cause configuration problems when the video display is not capable of handling multichannel audio. In those cases, it will send a signal back to the source (such as a DVD player or set-top box), limiting the digital audio output to two channels, even though a separate digital audio connection is made to the AVR.

If you encounter a situation in which an HDMI source and display are in use and a multichannel soundtrack does not trigger a "3/2/.1" message when playback begins, it may be necessary to change a setting in the source. In many cases, the setting is called "Audio Output," though it may vary from brand to brand. Change the setting to "bitstream" or "original" so that the digital audio output is returned to the multichannel data stream. For information about the specific setting on your source player, consult the manufacturer. This is not a problem with the AVR 445, but rather it is a by-product of HDMI and its associated content protection systems.

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 MiniDisc. 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 Dolby Pro Logic II processing is applied, as shown on page 24.

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

USB Playback

The AVR 445 is among the very few A/V receivers capable of direct connection to a computer for audio playback. Once the AVR is connected, audio streams and playback are possible through your AVR, with all the power and performance of the high-current amplifier, your own speakers, and the enhanced multichannel playback made possible through the use of Logic 7, Dolby Pro Logic II/IIx or DTS Neo:6 processing.

The AVR 445's USB connectivity may be used with PC-compatible computers running either Microsoft® Windows® 2000 with Service Pack 4 or higher installed, or Windows XP or Windows XP Media Center Edition with Service Pack 1 or higher installed. Connect one of the available USB ports on your computer or a USB hub to the **USB Port 33** on the AVR using a cable with a standard USB plug on one side and a USB "Mini B" plug on the other side. You may use an optional cable available at most electronics and computer stores for this purpose.

In addition, you will need to have a media player installed on the computer. The AVR 445 has been tested for operation with Windows Media® Player Version 8.0 and above, but it is also compatible with many other popular players such as iTunes®, Winamp® and RealPlayer.® In most cases, it is best to always make certain that you have the latest version of the player installed to ensure the best compatibility.

When the connection between a computer and the AVR is made for the first time, or if the USB connection is plugged into a different USB port on a computer or hub that has not been previously connected to the AVR, you will see a series of pop-up messages from Windows to indicate that the computer is configuring itself for the new device. Since the AVR provides a number of different functions, you may see the "Found New Hardware" message up to four times, one each

OPERATION

for "A/V Receiver," "Compatible Device," "Audio Receiver" and "Human Interface Device." When all messages have appeared and then cleared the screen, you are almost ready to begin.

Before selecting the USB input, first make certain that one of the media players listed above has been opened on the computer. Then you may select the USB input in any of the following ways:

- To select USB as a source from the front panel, press the **Input Source Selector Button 7** until USB appears as the input name in the **Upper Display Line 13** and in the semi-OSD display, if available. The **USB Input Source Indicator 11** will also light up on the front panel.
- To select USB as the input using the main remote press the **Input Selector 5** with DMP printed on the button twice.
- To select USB as the input using the ZR 10 remote, press the **USB Input Selector D**.

When the USB input is selected and the AVR 445 is connected to a compatible computer with one of the media players mentioned above open, you may then use either remote's transport controls to start and stop playback, as well as move to the next track. Activity of the Transport buttons may vary from one media player to another, but at the very least you will be able to use the Play and Stop buttons.

Once playback is started, the audio from a USB source is treated the same as any other two-channel audio source, and you may apply any of the appropriate surround processing modes. When playing back audio from a computer via the USB connection, the internal speakers in a laptop computer are often muted.

Speaker/Channel Indicators

In addition to the bitstream indicators, the AVR 445 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 22).

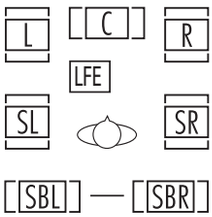


Figure 22

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 445. 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 445 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 445. 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 sources 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 at any time when a Dolby Digital source is playing by pressing the **Night Mode Button 30**. Each press of the button will change the Night mode setting, as shown in the lower third of the on-screen display (except when HDMI, 720p or 1080i sources are in use). To turn the Night mode off, press the button as described, until D-RANGE OFF is shown.

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 25 for information on using the menus to set this option.

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 445 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 445.
- 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 445 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, to make an analog recording using the **Tape Outputs** 3 and **Video 1 Audio Outputs** 43, you must change the REC OUT setting on the second page of the IN/OUT SETUP menu (Fig. 3) to DSP DWNMIX. The digital signals will be passed through to the **Digital Audio Outputs** 34 35.

Using The Bridge

The AVR 445 is equipped for use with Harman Kardon's optional The Bridge iPod docking station.

When The Bridge is connected to the AVR and an iPod properly docked, you may use either remote to control the iPod for audio playback while using the front-panel display and on-screen semi-OSD messages to help you locate tracks or view information about the track being played. In addition, connecting an iPod to the AVR 445 through The Bridge also charges the iPod's battery. You may even have the AVR 445 automatically turn on with your iPod as a playback source whenever the iPod is turned on, by using the DMP AUTO POWER menu option, described on page 43.

To select The Bridge as the AVR's input source:

- From the front panel, press the **Input Source Selector** 7 on the front panel as needed.
- From the main remote, press the **DMP Input Selector** 4.
- From the ZR 10 remote, press the The Bridge /DMP S R.

When The Bridge is connected and a compatible iPod properly docked, the iPod's menu will be replaced with "harman/kardon" at the top of the iPod's screen and the front-panel display and semi-OSD message will show messages that will guide you through the menu and content selection. If the **Lower Display Line** 14 shows an UNPLUGGED... message, please check to see that the correct iPod adapter is used in The Bridge and that the iPod is properly seated.

The AVR's front-panel controls may also be used to access a limited number of iPod functions. Press the **Tuning Mode Button** 8 to play or pause the current track. The **Tuning Selector** 4 may be used to search in reverse (left side of button) or forward (right side of button) through the tracks. Press the **Tuner Band Selector** 5 to call up the iPod's menu. Press the **Preset Station Selectors** 6 to scroll and the **Set Button** I to select. For complete information on using the remote or front-panel controls to operate an iPod, see the instructions that are included with The Bridge.

AM/FM Tuner Operation

The AVR 445's AM/FM 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.

Tuner and Station Selection

The AVR 445's AM/FM tuner may be selected as the unit's source, and stations changed, by following one of these steps:

- From the front panel, press the **Input Source Selector** 7 until the desired tuner frequency band (AM, FM or XM) appears. To change stations within a frequency band, press the **Tuning Selection** 4.
- You may also press the front panel's **Tuner Band Selector** 5 to select the tuner. The first press will select the last used frequency band and station. Subsequent presses will change the frequency bands, selecting the last used station or XM program used. Press the **Tuning Selection** 4 to change stations within a frequency band.
- From the main remote, press the **Tuner/FM Select Button** 34 by pressing the button up towards the top of the remote. The first press of the button selects the frequency band and station or XM channel that was last tuned. Press the button again to select between FM, AM and XM. You may also directly select the FM tuner by pressing the **Tuner/FM Select Button** 34 down toward the bottom of the remote. To change stations, press the **Tuning Up/Down Button** 23.
- To select the tuner from the ZR 10 remote, press the **Tuner Selector** E, or for XM Radio press the **XM Radio Selector Button** F (when an optional XM Connect & Play module is connected and the programming service has been activated).
- To change the tuning mode, press the **Tuning Mode Button** 8 12 O.

When the button is pressed so that AUTO/STEREO appears in the **Upper Display Line** 13, each press 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.

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

NOTE: When FM reception of a station is weak, audio quality will be increased by switching to Mono mode by switching to the MANUAL/MONO mode.

Preset Tuning

Using the remote, up to 30 AM or FM stations may be stored in the AVR 445'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** 38 N; the station's frequency will flash.
2. Within 5 seconds, press the **Numeric Keys** 39 J 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** 39 J 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 Buttons** 6 22 on the front panel or the main remote, or the **Prev/Next Transport Controls** P on the ZR 10 remote.

XM Radio Operation

XM Radio is a satellite-delivered service that offers hundreds of program channels, as well as local traffic and weather information for select cities. The AVR 445 is "XM Ready," which means that the unit is able to receive the XM service when an optional XM Connect & Play module is connected and the service activated. You may purchase the antenna module needed for XM Radio from many electronics or online retailers, or directly from XM Radio through the "Home Receivers" section of the XM Radio Store at www.xmradio.com.

OPERATION

Once you have purchased the XM module, follow the instructions accompanying it to activate the XM Service. Connect the plug on the XM module to the **XM Ready Input** 32 on the rear panel of the AVR 445. For best results, point the antenna module out a window, again, following the instructions packed with the XM product. If a window view is not available for the antenna, XM Radio operates a series of terrestrial repeater stations that may be able to provide reception, though this service is not available everywhere.

IMPORTANT NOTE: XM Radio requires both the optional, external antenna module and a subscription to the XM Radio service. Antenna and service sold separately; XM Radio is not available in Alaska or Hawaii.

If you need to view the antenna module's number, connect it to the AVR and then follow one of the steps shown below to select XM Radio as the input source. Tune to "000" to get a readout of the number.

Once you have an activated module connected, follow one of these steps to select XM Radio as your system's audio source:

- From the front panel, press the **Input Source Selector** 7. If XM was the last-used tuner source, it will appear; or press the button again until XM Radio is heard. Press the **Tuning Selector** 4 to change stations within a frequency band. Press the **Tuning Selector** 4 to select a different XM channel.
- From the main remote, press the **Tuner/FM Select Button** 34 by pressing the button up towards the top of the remote as needed until XM Radio is shown as the source. To change stations, press the **Tuning Up/Down Button** 23.
- To select the tuner from the ZR 10 remote control, press the **XM Radio Selector Button** F. Channels are selected using the **Prev/Next Transport Controls** P.

While using XM Radio is similar in many ways to AM/FM terrestrial radio, the wide range of program choices available, as well as the ability of the XM service to add special data and information tags into the digital audio data stream, means that some of the front-panel and remote controls traditionally used for tuner operation have different functions with XM Radio.

- When XM Radio is the AVR's source, the channel number will appear in the **Upper Display Line** 13, along with an indication of the Preset number, if any, and a series of bars at the far right end of the display. These bars (not shown in the semi-OSD message), show the current signal strength similar to the signal strength displays on a cellular phone.
- The current channel's name will normally appear in the **Lower Display Line** 14. For local traffic information, the name of a city will be shown in place of the channel name. You may change this display to show the current artist and track title information by pressing the **Tuning Mode Selector** 8 12 O. When you are listening to a channel with local traffic information in the "200" series of channel numbers, these buttons change the display to show the temperature and current weather for the selected city.
- To tune a channel number directly, simply press the **Numeric Keys** 39 J. Unlike standard AM/FM tuner operation, it is not necessary to press the Direct button first.
- The AVR 445 has five banks of preset memories for XM Radio, each with eight memory positions and designated by a letter ("A" through "E"). To store a channel into a memory group, first press the **Set Button** 16 Q until PRESET SEARCH appears in the **Upper Display Line** 13 and on the top line of the semi-OSD display. Next, press the ◀/▶ **Navigation Buttons** 14 G until the desired preset memory bank letter appears in the **Lower Display Line** 14 and in the bottom line of the semi-OSD display. Next, press the **Memory Button** 38 N and note that a dash will start to flash next to the preset memory bank letter. Within five seconds, press the **Numeric Button** 39 J from 1 to 8 for the memory slot you wish to use.
- To tune up or down through a list of channels stored in the currently active preset memory, press the **Preset Up/Down Buttons** 22. You may also use the **Preset Station Selector** 6 on the front panel, or the **Prev/Next Transport Controls** P on the ZR 10 remote. To change to another preset bank, press the **Set Button** 16 I Q and then press the ◀/▶ **Navigation Buttons** H 14 G until the desired preset memory bank letter appears in the **Lower Display Line** 14 and in the bottom line of the semi-OSD display.
- Each XM Radio channel is assigned a category, which may be viewed by pressing the **Tuning Mode Selector** 12 8 O. You may search for an XM channel in any of the categories by first pressing the **Set Button** 16 I Q and then pressing the ◀/▶ **Navigation Buttons** H 14 G until the desired category name appears in the **Lower Display Line** 14 and in the bottom line of the semi-OSD display. Press the **Set Button** 16 I Q again to start the search for the next channel in that category.
- Note that you may see a LOADING message, indicating that the XM tuner is downloading content and may not be able to operate. If the message continues to appear, check to see whether the XM antenna is properly positioned toward a south-facing window, experiment with the antenna position, or change to another input and then reselect XM Radio.

Recording

In normal operation, the audio or video source selected for listening through the AVR 445 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** 3 or **Video 1 Audio** and **Video Outputs** 29 43 in the record mode. Remember that if your source is Dolby Digital or DTS, and you wish to make an analog recording, you must change the REC OUT setting on the second page of the IN/OUT SETUP menu (Figure 3) to DSP DWNMIX.

When a digital audio recorder is connected to the **Digital Audio Outputs** 34 35, you are able to record the digital signal using a CD-R, MiniDisc or other digital recording system.

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.
- The **Front-Panel Video 4** N jacks may be configured for use as outputs, allowing connection to a recorder, when the steps shown in the section below are followed.
- 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.

Front-Panel Connections

In addition to the rear-panel digital and analog outputs, the AVR 445 offers Harman Kardon's exclusive configurable front-panel output-jack feature. For easy connection of portable devices, you may switch the front-panel **Video 4 Jacks** N from an input to an output by changing the VIDEO 4 setting on the second page of the IN/OUT SETUP menu (Figure 3) from IN to OUT.

Once the setting is made, the **Input/Output Status Indicator** M will turn red, indicating that the jacks are now outputs, instead of the default setting as inputs. Once changed to an output, the setting will remain as long as the AVR 445 is turned on, unless the setting is changed in the OSD menu system. However, once the AVR 445 is turned off, the setting is canceled. When the unit is turned on again, the front-panel jacks will return to their normal default setting as inputs.

Output Level Trim Adjustment

Normal output level adjustment for the AVR 445 is established using EzSet/EQ, as outlined on pages 26–28. In some cases, however, it may be desirable to trim 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 H.

Once the reference level has been set, press the **Channel Select Button** 13 E and FRONT L LEVEL will appear in the **Lower Display Line** 14. To change the level, first press the **Set Button** I 16, and then use the ▲/▼ **Navigation Buttons** H 14 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** I 16; then press the ▲/▼ **Navigation Buttons** H 14 to select the next output-channel location that you wish to adjust. To adjust the subwoofer level, press the ▲/▼ **Navigation Button** H 15 until WOOFER 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 445 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 31.

EzSet/EQ On/Off

If you wish to turn the filter settings established by EzSet/EQ on or off to demonstrate the impact EzSet/EQ has on the sound of your system, simply press the **EzSet/EQ On/Off button** 11. Using this feature does not change the settings; it merely puts them in or out of the signal path.

Dim Function

Since the AVR 445 will often be used when movies or other kinds of video programming are 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 42, or you may control the brightness directly from the remote.

Simply press the **Dim Button** 33 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 **Dim Button** 33 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 42.

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.

ADVANCED FEATURES

The AVR 445 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.

To change a setting from its factory default, you will use the ADVANCED menu. Press the OSD Button 31 B to call up the MAIN MENU (Figure 1). Next, press the ▲/▼ Navigation Buttons 14 G so that the cursor is next to ADVANCED; then press the Set Button 16 Q. When the ADVANCED menu (Figure 23) appears, follow the instructions shown below to make any needed configuration adjustments.

```
        * ADVANCED *

→ VFD FADE TIME OUT: OFF
  VFD BRIGHTNESS: FULL
  VOLUME DEFAULT: OFF ON
  DEFAULT VOL SET: -25dB
  SEMI OSD TIME OUT: 5S
  FULL OSD TIME OUT: 20S
  DMP AUTO POWER: OFF ON

  BACK TO MASTER MENU
```

Figure 23

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 41. 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.

With the ADVANCED menu on your video display, press the ▲/▼ Navigation Buttons 14 G so that the cursor is pointed to the VFD FADE TIME OUT line. Next, press the ◀/▶ Navigation Buttons 14 G 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 function, the Fade function will not operate.

If you wish to make adjustments to other items on the ADVANCED menu, press the ▲/▼ Navigation Buttons 14 G 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 16 Q to make an adjustment to another menu. If you have completed all adjustments, press the OSD Button 31 B to exit the menu system.

Display Brightness

The AVR 445'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.

Next, press the ▲/▼ Navigation Buttons 14 G until the cursor is next to the VFD line. Press the ◀/▶ Navigation Buttons 14 G 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 Buttons 14 G until the cursor is next to the desired setting or the BACK TO MASTER MENU line and press the Set Button 16 Q. If you have no other adjustments to make, press the OSD Button 31 B to exit the menu system.

Turn-On Volume Level

As is the case with most audio/video receivers, when the AVR 445 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 445 turn on at a specific setting, regardless of what was last in use when the unit was turned off.

With the ADVANCED menu on the screen, press the ▲/▼ Navigation Buttons 14 G as needed until the cursor is next to the DEFAULT VOL SET line. Press the ◀/▶ Navigation Buttons 14 G 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 H. 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 Buttons 14 G 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 Buttons 14 G until the on-screen cursor is next to the desired setting or the BACK TO MASTER MENU line, and press the Set Button 16 Q. If you have no other adjustments to make, press the OSD Button 31 B 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 (except when HDMI, 720p or 1080i sources are in use). 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 445.

With the ADVANCED menu on the screen, press the ▲/▼ Navigation Buttons 14 G so that the cursor is pointing to the SEMI OSD/TIME OUT line. Then 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 Buttons 14 G 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 Buttons 14 G so that OFF is shown on the right side of the line.

To make other adjustments, press the ▲/▼ Navigation Buttons 14 G until the cursor is next to the desired setting or the BACK TO MASTER MENU line and press the Set Button 16 Q. If you have no other adjustments to make, press the OSD Button 31 B 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 445 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.

With the ADVANCED menu on the screen (Figure 23) make certain that the cursor is next to the FULL OSD TIME OUT line by pressing the ▲/▼ **Navigation Buttons** 14 G as needed. Next, press the ◀/▶ **Navigation Buttons** 14 G 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 Buttons** 14 G until the cursor is next to the desired setting or the BACK TO MASTER MENU line and press the **Set Button** Q. If you have no other adjustments to make, press the **OSD Button** 31 B to exit the menu system.

DMP/ The Bridge™ Auto Power

When using Harman Kardon's optional The Bridge™ iPod docking station, the normal operation is to have the iPod selected as the input source only when it is specifically chosen. However, you may set the AVR so that whenever the iPod is turned on, the AVR will also turn on automatically and set The Bridge as the input.

To change the setting, first make certain that the ADVANCED menu (Figure 23) is on the screen, and then press the ▲/▼ **Navigation Buttons** 14 G until the cursor is pointing to DMP AUTO POWER. Press the ▲/▼ **Navigation Buttons** 14 G so that ON is highlighted to have the AVR turn on in sync with an iPod, or OFF for standard operation.

MULTIROOM OPERATION

The AVR 445 is fully equipped to operate as the control center for a complete multiroom system that is capable of sending one audio 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 445 offers a comprehensive range of options for powering the speakers in the second zone.

- Using the line-level **Multiroom Audio Outputs 9**, 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 445 via a single Category 5/5e or higher cable, 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 445 includes a remote IR sensor input so that remote control commands from the ZR 10 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 18–19 for the connection of speaker wire and IR remote wiring to the AVR 445.

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 445 provides the capability for full bidirectional 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 professionals. 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 445 needs to be configured for multiroom operation. To change a setting from its factory default, use the MULTI-ROOM menu. First, press the **OSD Button 31 B** to call up the MAIN MENU (Figure 1). Next, press the **▲/▼ Navigation Buttons 14 G** so that the cursor is next to MULTI-ROOM, then press the **Set Button 16 Q**. When the MULTI-ROOM menu (Figure 24) appears, follow the instructions shown below to make any needed configuration adjustments.

```
        * MULTI-ROOM *

→ MULTI-ROOM:OFF ON
  MULTI IN:FM PRESET 01
  MR VOL:-25dB
  SB AMPS:MAIN MULTI
  CARRIER OUT: ZONE II

  BACK TO MASTER MENU
```

Figure 24

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 14 G** 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 Buttons 14 G** so that the on-screen cursor is next to the MULTI IN line.

At the MULTI IN line, press the **◀/▶ Navigation Buttons 14 G** until the desired input to the multiroom system appears in the highlighted video. In addition to direct selection of any active input source, you may also select the DSP DWNMIX mode, which outputs a two-channel down-mixed version of multichannel digital sources. When the selection has been made, press the **▼ Navigation Button 14 G** once so that the cursor is next to MR VOL.

At the MR VOL line, press the **◀/▶ Navigation Buttons 14 G** 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 Buttons 14 G** 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 B** to exit the menu system.

Surround Channel Amplifier Assignment

The AVR 445 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 445 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 menu (Figure 24) is on the screen; then press the **▲/▼ Navigation Buttons 14 G** so that the cursor is pointing to the SB AMPS line. Press the **◀/▶ Navigation Buttons 14 G** so that MULTI is shown in highlighted video. When this change is made, connect the wires feeding the remote zone speakers to the **Surround Back/Multiroom Speaker Outputs 15**.

When the SBL/SBR speakers are set for multiroom operation, you may still configure the AVR 445 for 7.1 modes in the main listening room by making certain that the SURR BACK line in the SPEAKER SIZE menu (Figure 18) is set to SMALL or LARGE, as shown in the instructions on pages 29–30. 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 1** in order to use surround back channel speakers.

Once this setting is made, press the ▲/▼ Navigation Buttons 14 G to select another configuration item on this page, or press the OSD Button 31 B if you have completed your adjustments to the Multiroom system.

Infrared Output Selection

The AVR 445 enables you to select which IR input will be used to feed the Full Carrier IR Output 12. The factory default setting is the IR signal that is fed to the Multiroom IR Input 24, but you may select other options.

To change this setting, first make sure that the MULTI-ROOM menu is on the screen, and then press the ▲/▼ Navigation Buttons 14 G so that the cursor is next to CARRIER OUT; then press the Set Button 16 Q. Press the ▲/▼ Navigation Buttons 14 G to select one of these options:

- ZONE II feeds the signal present at the Multiroom IR Input 24 to the Full Carrier IR Output 12.
- A-BUS feeds the signal carried back from an optional A-BUS module connected to the AVR to the Full Carrier IR Output 12.
- FRONT feeds the received through the front-panel Remote Sensor Window 16 to the Full Carrier IR Output 12.

When all the necessary adjustments to the MULTI-ROOM menu have been made, press the ▲/▼ Navigation Buttons 14 G until the cursor is pointing to BACK TO MASTER MENU to make changes to other menus, or press the OSD Button 31 B to exit the menu system and return to normal operation.

Multiroom Operation

When operating the AVR 445 from a remote room where an IR sensor or A-BUS module has been installed and properly connected back to the AVR, you may use either the main remote control, the ZR 10 or any remote programmed with standard Harman Kardon remote control codes. Unlike many other products, the AVR 445 does not use different codes for main room and remote room operation.

To turn the AVR on from the remote room, simply point the remote at the sensor and press either the AVR Selector 5 C, any of the Input Selectors D 4, or the discrete source selection buttons for inputs such as the Tuner E 34, XM Radio F or The Bridge R. To turn the multiroom system off from a remote room, press the Power Off Button A 2.

When the multiroom system is turned on, you may use the same buttons on either remote that would normally be used to control an AVR function such as volume, source selection, tuner control or the operation of an iPod docked to The Bridge. If any of the input devices are connected to the IR Output 13 or Full Carrier IR Output 12, by either a hard-wire connection or through an optional IR "blaster," you may use the Transport Controls P on the ZR 10 to operate compatible Harman Kardon products.

To turn the system off from the remote room, press the Power Off Button 1 A. Remember that the AVR 445 may be turned on or off from the remote room, regardless of the system's operation or status in the main room.

NOTE: When XM Radio or 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 the multiroom system on or off from the room where the AVR is located, press the Multiroom Button 27. When the MULTI ON/OFF message appears in the Lower Display Line 14 press the Set Button 16 and then press the ◀/▶ Navigation Buttons 14 so that the display changes to MULTI ON or MULTI OFF, as desired. Press the Set Button 16 again to activate the command.

NOTE: The multiroom system will remain on even when the AVR is turned off in the main listening room where it is located. When the AVR 445's multiroom system is turned on, but the unit is in the Standby mode (turned "off") in the room where the AVR 445 is located, the light surrounding the front-panel Standby/On Switch 1 will remain blue, rather than amber, and a MULTI-ROOM ON message will be shown in the Lower Display Line 14.

When the Multiroom system is turned on, the input selected using the Multiroom menu will be fed to the Multiroom Audio Outputs 9 on the rear panel as well as the A-BUS Connector 4. The volume will be as set in the previous selection, although it may also be adjusted using an optional IR sensor and the ZR 10 remote in the remote location, or the A-BUS keypad, or on the optional audio power amplifier connected to the Multiroom Audio Outputs 9.

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.

To change the input source or volume in the remote zone from the room where the AVR is located, press the Multiroom Button 27. When the MULTI ON/OFF message appears in the Lower Display Line 14, press the Set Button 16 and then press the ▲/▼ Navigation Buttons 14 so that the display changes to either MULTI INPUT or MULTI LEVEL, depending on which setting you wish to change. Press the Set Button 16 again and then use the ◀/▶ Navigation Buttons 14 to change the input or volume. Press the Set Button 16 one more time to activate the command.

Note that the this volume adjustment controls the level for the output to the Multiroom Audio Outputs 9 and for any speakers connected to the Surround Back/Multiroom Speaker Outputs 15 when the Surround Back amplifier channels are configured for Multiroom use, as shown on page 44. 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.

CONFIGURING THE REMOTE

The AVR 445 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 445 remote using its extensive library of remote codes or a head-to-head learning process for codes not in the internal library.

As an alternative to the AVR remote, consider purchasing Harman Kardon's TC 30 activity-based remote, which uses Web setup wizards to custom configure your remote. For more information visit www.harmankardon.com.

Thanks to the remote's advanced technology and two-line LCD, 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 3 seconds while the message shown in Figure 25 appears in the remote's **LCD Information Display** ③. Release the button when the red light under the **Set Button** ⑯ appears.

```
HOLD PROG BUTTON
FOR 3 SECONDS
```

Figure 25

3. The remote's **MAIN MENU** message (Figure 26), will appear in the LCD and the **Set Button** ⑯ will remain illuminated in red. Press the **Set Button** ⑯ to begin the process of selecting a device and locating the proper remote codes.

```
MAIN MENU
PROGRAM DEVICE                ▲
```

Figure 26

4. **SELECT A DEVICE** will appear in the LCD (Figure 27). Press the ▲/▼ **Navigation Button** ⑭ to scroll through the list of device categories and press the **Set Button** ⑯ 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 27

NOTE: The codes for hard-drive recorder products (DVR) such as TiVo® 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 (Figure 28), press the **Set Button** ⑯ 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 28

6. The next menu screen on the remote (Figure 29) will show the start of the list of available brands. Press the ▲/▼ **Navigation Buttons** ⑭ 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** ⑯.

```
SELECT BRAND
RCA                           ▲
```

Figure 29

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 47 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 47.

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** ㊴ shown on the menu screen (Figure 30) one at a time, starting with the "1" button. After you press the **"1" Button** ㊴, 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 30

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 31), if your device has turned off, press the **Set Button** ⑯, 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 31

9. If the device being programmed into the AVR remote does *not* turn off after you have pressed the **"1" Button** ㊴, 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 47.
10. When the device being programmed does turn off after a numeric key has been pressed, you must press the **Set Button** ⑯ within 5 seconds to enter the setting into the remote's memory. After you press the **Set Button** ⑯, the top line of the LCD 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 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 3 seconds while the message shown in Figure 25 appears in the remote's **LCD Information Display** 3. Release the button when the red light under the **Set Button** 16 appears.
3. The remote's MAIN MENU message (Fig. 26) will appear in the LCD and the **Set Button** 16 will remain illuminated in red. Press the **Set Button** 16 to begin the process of selecting a device and locating the proper remote codes.
4. SELECT A DEVICE will appear in the LCD (Figure 27). Press the ▲/▼ **Navigation Button** 14 to scroll through the list of device categories and press the **Set Button** 16 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** 14 so that the bottom line of the LCD reads AUTO (Figure 32) and then press the **Set Button** 16 to enter the Automatic programming mode.

```
PROGRAM DEVICE
AUTO                ▲
```

Figure 32

6. As instructed on the next menu screen, press the ▲ **Navigation Button** 14 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 screen while the bottom line reads PLEASE WAIT... . You will also see the transmit icon in the upper right corner of the LCD'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 33. Following the instructions, if the device being programmed has *not* turned off, press the ▲ **Navigation Button** 14 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 33

8. By pressing the ▲ **Navigation Button** 14 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 34 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** 16 as instructed to exit the programming process.

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

Figure 34

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** 39 in sequence, as instructed in Figure 33. Point the remote at the device being programmed, and press the **"1" Button** 39 to see whether the device turns back on.
10. After pressing and releasing the **"1" Button** 39, 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** 39, or the next button in the numeric sequence if you are repeating the procedure, as instructed by the LCD screen in Figure 35.

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

Figure 35

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** 39 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 33 and press the **Set Button** 16 within five seconds of the device turning on. After you press the Set button, the top line of the LCD 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 445'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. 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 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.

CONFIGURING THE REMOTE

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** ㊻ 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 25 appears in the remote's **LCD Information Display** ❸. Release the button when the red light under the **Set Button** ⑯ appears.

2. The remote's MAIN MENU message (Fig. 26), will appear in the LCD and the **Set Button** ⑯ will remain illuminated in red. Press the ▲ **Navigation Button** ⑭ so that LEARN appears on the bottom line of the LCD screen, as shown in Figure 36. Press the **Set Button** ⑯ to begin the process of learning commands from another device's remote into the AVR remote.

```
MAIN MENU
LEARN                ▲
```

Figure 36

3. To program the codes for a device's remote into the AVR remote, press the ▲/▼ **Navigation Buttons** ⑭ until the words LEARN KEY appear in the bottom line of the LCD, as shown in Figure 37. Press the **Set Button** ⑯ 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".

```
LEARN
LEARN KEY            ▲
```

Figure 37

4. The SELECT A DEVICE message will appear in the LCD (Figure 27). Press the ▲/▼ **Navigation Buttons** ⑭ to scroll through the list of device categories and press the **Set Button** ⑯ 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 38) 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.

```
SELECT A KEY
TO PROGRAM
```

Figure 38

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 39).

```
PRESS KEY ON
ORIGINAL REMOTE
```

Figure 39

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 40. If you see that message, proceed to Step 10. If the code is *not* successfully learned, you will see the display shown in Figure 41. If that menu appears, proceed to Steps 8 and 9.

```
LEARN MENU
LRN ANOTHER KEY      ▲
```

Figure 40

```
LEARN FAILED
RETRY                ▲
```

Figure 41

8. If the message shown in Figure 41 appears in the display, press the **Set Button** ⑯ 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 39, 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 changes again. If the code was successfully learned, you will see the display shown in Figure 40. In that case, go to Step 10. If the LEARN FAILED display (Figure 41) appears again, you may either try to program the key again, or press the ▲ **Navigation Button** ⑭ 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 42 appears, press the **Set Button** ⑯ to exit the Learning system.

```
LEARN FAILED
EXIT                 ▲
```

Figure 42

10. When a code has been learned successfully, you have a number of options. When the display shown in Figure 40 is on the LCD screen on the AVR remote, you may press the **Set Button** ⑯ 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 when the button that has just had a new code learned is pressed, press the ▲ **Navigation Button** ⑭ so that the display shown in Figure 43 appears in the LCD. Press the **Set Button** ⑯ 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 53–54. 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 53.

```
LEARN MENU
RENAME KEY           ▲
```

Figure 43

12. When you have programmed all keys for the desired device, press the ▲ **Navigation Button** ⑭ when LEARN MENU (Figure 40) appears so that you see the display shown in Figure 44. Press the **Set Button** ⑯ to return the remote to normal operation.

```
LEARN MENU
END LEARNING         ▲
```

Figure 44

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 445's remote allows you to learn a specific code to be attached to one of the **Input Selectors** ❹ 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** ❹, 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** ⑭ until LEARN DEVICE appears in the bottom line of the LCD.
- When the SELECT A DEVICE message (Figure 27) appears, as described in Step 4, press the specific **Input Selector Button** ❹ 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 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** ❹. 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 445 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 so that you see exactly which commands are being sent.

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

1. Press and hold the **Program Button** ㉕ for about three seconds while the message shown in Figure 25 appears in the remote's **LCD Information Display** ❸. Release the button when the red light under the **Set Button** ⑯ appears.

2. The remote's MAIN MENU message (Figure 26), will appear in the LCD and the **Set Button** ⑯ will remain illuminated in red. Press the ▲ **Navigation Button** ⑭ twice so that CHANGE DEVICE appears on the bottom line of the LCD screen, as shown in Figure 45. Press the **Set Button** ⑯ to begin the process of reassigning the commands used for a particular device.

```
MAIN MENU
CHANGE DEVICE                ▲
```

Figure 45

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 46 appears, press the ▲/▼ **Navigation Button** ⑭ 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** ⑯.

```
OLD DEVICE TYPE
TV                           ▲
```

Figure 46

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 47 appear, press the ▲/▼ **Navigation Button** ⑭ 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** ⑭ 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** ⑯ when the desired device combination appears.

```
NEW DEVICE TYPE
TV<-VCR                      ▲
```

Figure 47

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 49. To begin the process, start by selecting the brand of device, as shown in Fig. 29. Press the ▲/▼ **Navigation Button** ⑭ 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** ⑯.

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** ❸, press and release the **Numeric Keys** ㊴ one at a time, starting with the **"1" Button** ㊴. After you press the **"1" Button** ㊴, 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 (Figure 31), press the **Set Button** ⑯, 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** ㊴, 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** ⑯ 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 47.

9. When the device being programmed does turn off after a numeric key has been pressed, you must press the **Set Button** ⑯ within five seconds to enter the setting into the remote's memory. After you press the Set button, the top line of the LCD 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** ❹ 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.

CONFIGURING THE REMOTE

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 25 appears in the remote's **LCD Information Display** 3. Release the button when the red light under the **Set Button** 16 appears.

2. The remote's MAIN MENU message (Figure 26), will appear in the LCD and the **Set Button** 16 will remain illuminated in red. Press the ▲ **Navigation Button** 14 so that MACRO appears on the bottom line of the LCD, as shown in Figure 48. Press the **Set Button** 16 to enter the main macro menu branch.

```
MAIN MENU
MACRO                ▲
```

Figure 48

3. At the next menu screen (Figure 49) press the **Set Button** 16 to begin recording a macro.

```
MACRO
RECORD A MACRO       ▲
```

Figure 49

4. The next display screen (Figure 50) 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** 14 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.

```
RECORD A MACRO
POWER ON             ▲
```

Figure 50

5. The next screen that appears (Figure 51) is where you select the device for the first command that will be sent out as part of the macro. Press the ▲/▼ **Navigation Button** 14 until the name of the device appears on the left side of the lower line in the LCD. 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** 16 when the desired device name appears to move to the next programming step.

```
SELECT A DEVICE
AVR                  ▲
```

Figure 51

6. The next display (Figure 52) 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.

```
SELECT A DEVICE
AVR                  ▲
```

Figure 52

7. The next display (Figure 53) 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 445 to turn on, so the **Power Button** 2 should be pressed.

```
POWER ON    00/20
SELECT KEY PRESS
```

Figure 53

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 54).

```
[AVR]
[AVR] POWER ON
```

Figure 54

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 as your confirmation of the key entry (Figure 54).

10. When all commands for the macro have been entered, press the **Set Button** 16 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. 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. 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 25 appears in the remote's **LCD Information Display** 3. Release the button when the red light under the **Set Button** 16 appears.

2. The remote's MAIN MENU message (Figure 26), will appear in the LCD and the **Set Button** 16 will remain illuminated in red. Press the ▲ **Navigation Button** 14 so that MACRO appears on the bottom line of the LCD screen, as shown in Figure 48. Press the **Set Button** 16 to enter the main macro menu branch.

3. At the next menu screen (Figure 55), press the ▲/▼ **Navigation Button** 14 until the bottom line in the remote's LCD reads ERASE A MACRO. Press the **Set Button** 16 to begin the process of erasing a macro.

```
MACRO
ERASE A MACRO        ▲
```

Figure 55

4. The next display screen (Figure 56) is where you select which macro will be erased. Press the ▲/▼ **Navigation Button** 14 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** 16.

```
ERASE A MACRO
POWER ON
```

Figure 56

5. The word ERASED will flash four times in the bottom line of the remote's LCD, 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:

1. Press and hold the **Program Button** 25 for about 3 seconds while the message shown in Figure 25 appears in the remote's **LCD Information Display** 3. Release the button when the red light under the **Set Button** 16 appears.
2. The remote's MAIN MENU message (Fig. 26), will appear in the LCD and the **Set Button** 16 will remain illuminated in red. Press the ▲ **Navigation Button** 14 so that MACRO appears on the bottom line of the LCD screen, as shown in Figure 48. Press the **Set Button** 16 to enter the main macro menu branch.
3. At the next menu screen (Figure 57), press the ▲/▼ **Navigation Button** 14 until the bottom line in the remote's LCD shows READ A MACRO. Press the **Set Button** 16 to begin the process of erasing a macro.

```
MACRO
READ A MACRO
```

Figure 57

4. The next display screen (Figure 58) is where you select the macro to be read. Press the ▲/▼ **Navigation Button** 14 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** 16.

```
READ A MACRO
POWER ON
```

Figure 58

5. 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** 14 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., [AVR]). When the step in the macro is a function, navigation or any other button, it will appear next to the bracketed readout of the underlying device (e.g., [AVR] POWER ON).
6. When you are finished reviewing the macro's contents, press the **Set Button** 16 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 445, you will most likely want to use the AVR 445'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 445'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 445's controls with other sources, such as DVD. To have the AVR 445's volume commands used when the TV device is selected, follow these steps:

1. Press and hold the **Program Button** 25 for about 3 seconds while the message shown in Figure 25 appears in the remote's **LCD Information Display** 3. Release the button when the red light under the **Set Button** 16 appears.
2. The remote's MAIN MENU message (Figure 26), will appear in the LCD and the **Set Button** 16 will remain illuminated in red. Press the ▲/▼ **Navigation Button** 14 until PUNCH-THROUGH appears on the bottom line of the LCD screen, as shown in Figure 59. Press the **Set Button** 16 to enter the main punch-through menu branch.

```
MAIN MENU
PUNCH-THROUGH
```

Figure 59

3. At the next menu screen (Figure 60), press the **Set Button** 16 to begin programming the remote for Volume punch-through.

```
PUNCH-THROUGH
VOLUME
```

Figure 60

4. The next display screen (Figure 61) 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 445's volume controls to be active. Press the ▲/▼ **Navigation Button** 14 until the name of the base device appears and then press the **Set Button** 16.

```
DEVICE IN USE
TV
```

Figure 61

5. At the next display screen (Figure 62), you will select the device whose Volume Up/Down and Mute commands will be used. Press the ▲/▼ **Navigation Button** 14 until the desired device's name appears to the right of the device in use. In our example, that is the AVR 445 (indicated by AVR). When the desired combination of devices appears, press the **Set Button** 16.

```
PUNCH-THROUGH
TV<-AVR
```

Figure 62

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 63. The word SAVED will flash four times and then the remote will return to normal operation.

```
TV<-AVR [VOL]
     SAVED
```

Figure 63

7. 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 45 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 64.

```
PUNCH-THROUGH
TV<-TV
```

Figure 64

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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 3 seconds while the message shown in Figure 25 appears in the remote's **LCD Information Display** 3. Release the button when the red light under the **Set Button** 16 appears.

2. The remote's MAIN MENU message (Figure 26), will appear in the LCD and the **Set Button** 16 will remain illuminated in red. Press the ▲/▼ **Navigation Button** 14 until PUNCH-THROUGH appears on the bottom line of the LCD screen, as shown in Figure 59. Press the **Set Button** 16 to enter the main punch-through menu branch.

3. At the next menu screen, press the ▲/▼ **Navigation Button** 14 until CHANNEL appears on the bottom line of the LCD screen, as shown in Figure 65. Press the **Set Button** 16 to begin programming the remote for Channel punch-through.

```
PUNCH-THROUGH
CHANNEL                ▲
```

Figure 65

4. The next display screen (Figure 66) 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** 14 until the name of the base device appears and then press the **Set Button** 16.

```
DEVICE IN USE
VCR                    ▲
```

Figure 66

5. At the next display screen (Figure 67), you will select the device whose Channel Up/Down commands will be used. Press the ▲/▼ **Navigation Button** 14 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** 16.

```
PUNCH-THROUGH
VCR<-CBL               ▲
```

Figure 67

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 68. The word SAVED will flash four times and then the remote will return to normal operation.

```
VCR<-CBL [CHAN]
     SAVED             ▲
```

Figure 68

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 69.

```
PUNCH-THROUGH
VCR<-VCR               ▲
```

Figure 69

Transport Punch-Through

The **Play** 17, **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 3 seconds while the message shown in Figure 25 appears in the remote's **LCD Information Display** 3. Release the button when the light under the **Set Button** 16 turns red.

2. The remote's MAIN MENU message (Figure 26), will appear in the LCD and the **Set Button** 16 will remain illuminated in red. Press the ▲/▼ **Navigation Button** 14 until PUNCH-THROUGH appears on the bottom line of the LCD screen, as shown in Figure 59. Press the **Set Button** 16 to enter the main punch-through menu branch.

3. At the next menu screen, press the ▲/▼ **Navigation Button** 14 until TRANSPORT appears on the bottom line of the LCD screen, as shown in Figure 70. Press the **Set Button** 16 to begin programming the remote for transport punch-through.

```
PUNCH-THROUGH
TRANSPORT              ▲
```

Figure 70

4. The next display screen (Figure 71) 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** 14 until the name of the base device appears and then press the **Set Button** 16.

```
DEVICE IN USE
TV                     ▲
```

Figure 71

5. At the next display screen (Figure 72), select the device whose transport commands will be used. Press the ▲/▼ **Navigation Button** 14 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** 16.

```
PUNCH-THROUGH
TV<-VCR                ▲
```

Figure 72

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 73. The word SAVED will flash four times and then the remote will return to normal operation.

```
TV<-VCR [TRS]
     SAVED             ▲
```

Figure 73

7. 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 74.

```
PUNCH-THROUGH
TV<-TV                ▲
```

Figure 74

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."

1. Press and hold the **Program Button** 25 for about 3 seconds while the message shown in Figure 25 appears in the remote's **LCD Information Display** 3. Release the button when the red light under the **Set Button** 16 appears.

2. The remote's MAIN MENU message (Figure 26), will appear in the LCD and the **Set Button** 17 will remain illuminated in red. Press the ▲/▼ **Navigation Button** 14 until RENAME appears on the bottom line of the LCD screen, as shown in Figure 75.

```
MAIN MENU
RENAME                ▲
```

Figure 75

3. At the next menu screen, press the ▲/▼ **Navigation Button** 14 until RENAME DEVICE appears on the bottom line of the LCD screen, as shown in Figure 76. Press the **Set Button** 16 to begin renaming a device.

```
RENAME
RENAME DEVICE         ▲
```

Figure 76

4. The next display screen (Figure 77) is where you select the device that will be renamed. In our example, that is the TV button. Press the ▲/▼ **Navigation Button** 14 until the name of the base device appears and then press the **Set Button** 16.

```
RENAME DEVICE
TV                    ▲
```

Figure 77

5. 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** 14 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.

6. To enter the new name, press the **Numeric Keys** 39. 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.

7. 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 a "D," so you would press the "3" button once.

   b. To enter a letter that uses the same numeric key, you must first press the ▶ **Navigation Button** 14 to move the blinking cursor block to the next position. Then press the **Numeric Key** 39 as required to enter the desired letter.

   c. To enter a blank space, press the ▶ **Navigation Button** 14 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.

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

9. When the text entry is complete, press the **Set Button** 16. The LCD 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 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 445.

NOTES ON RENAMING DEVICES:

- To move the cursor to the right or left of the display during the renaming process, press the ◀/▶ **Navigation Buttons** 14 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 a device changes the name of the device only, not any of the individual key functions within that device memory. To change the name of an individual device, follow the instructions in the next section.

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 3 seconds while the message shown in Figure 25 appears in the remote's **LCD Information Display** 3. Release the button when the red light under the **Set Button** 16 appears.

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2. The remote's MAIN MENU message (Figure 26), will appear in the LCD and the **Set Button** 16 will remain illuminated in red. Press the ▲/▼ **Navigation Button** 14 until RENAME appears on the bottom line of the LCD screen, as shown in Figure 75.

3. At the next menu screen press the ▲/▼ **Navigation Button** 14 until RENAME KEY appears on the bottom line of the LCD screen, as shown in Figure 78. Press the **Set Button** 16 to continue.

```
RENAME
RENAME KEY                ▲
```

Figure 78

4. The next display screen (Figure 79) selects the device within which the key to be renamed exists. Press the ▲/▼ **Navigation Buttons** 14 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** 16.

```
SELECT A DEVICE
DVD                       ▲
```

Figure 79

5. At the next menu screen, select the first button within the device to be renamed, as instructed in the display shown in Figure 80. Select the button by simply pressing it on the remote.

```
SELECT A KEY
```

Figure 80

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, and a blinking block cursor will appear on the far left side of the bottom line of the display, as shown in Figure 81.

```
DISC SKIP
```

Figure 81

   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 82.

```
▮
```

Figure 82

7. To enter the new name for the key, press the **Numeric Keys** 39. 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 this page 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** 14 to move the blinking cursor block to the next position. Then press the **Numeric Key** 39 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** 14 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** 16. 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** 16 as instructed by the bottom line of the LCD 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 though 11 to rename the next key.

   b. If you have no additional keys to rename, press the ▲ **Navigation Button** 14 once so that the menu screen displays EXIT on the bottom line of the display. Press the **Set Button** 16 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 45 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 3 seconds while the message shown in Figure 25 appears in the remote's **LCD Information Display** 3. Release the button when the red light under the **Set Button** 16 appears.

2. The remote's MAIN MENU message (Figure 26), will appear in the LCD and the **Set Button** 16 will remain illuminated in red. Press the ▲/▼ **Navigation Button** 14 until USER RESET appears on the bottom line of the LCD screen, as shown in Figure 83.

```
MAIN MENU
USER RESET                ▲
```

Figure 83

3. Press the **Set Button** 16 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 84. 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.

```
RESETTING...
```

Figure 84

4. When the remote has been totally reset and returned to the factory default condition, a **REMOTE RESET COMPLETE** message will appear (Figure 85) briefly, and then the remote will return to normal operation.

```
REMOTE RESET
COMPLETE
```

Figure 85

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** ❹ 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 25 appears in the remote's **LCD Information Display** ❸. Release the button when the red light under the **Set Button** ⓰ appears.

2. The remote's **MAIN MENU** message (Fig. 26) will appear in the LCD and the **Set Button** ⓰ will remain illuminated in red. Press the ▲/▼ **Navigation Buttons** ⓮ until **DEVICE PRIORITY** appears in the bottom line of the LCD, as shown in Figure 86, and press the **Set Button** ⓰.

```
MAIN MENU
DEVICE PRIORITY                ▲
```

Figure 86

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

```
DEVICE PRIORITY
NORMAL                         ▲
```

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** ❹, 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** ❺ 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** ⓰ one more time. The LCD 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 445'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** ㉖ 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 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 25 appears in the remote's LCD. Release the button when the red light under the **Set Button** ⓰ appears.

2. When the remote's **MAIN MENU** message (Figure 26) appears in the LCD and the **Set Button** ⓰ remains illuminated in red, press the ▲/▼ **Navigation Button** ⓮ until **BACK LIGHT** appears in the bottom line of the LCD screen, as shown in Figure 88.

```
MAIN MENU
BACK LIGHT                     ▲
```

Figure 88

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

```
BACK LIGHT
ON FULL                        ▲
```

Figure 89

4. Press the **Set Button** ⓰ one more time. The LCD 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.

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 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** ❿. 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.

CONFIGURING THE REMOTE

- 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.

```
AVR
LOW BATTERY
```

Figure 91

TROUBLESHOOTING GUIDE

SYMPTOM	CAUSE	SOLUTION
Unit does not function when Main Power Switch is pushed	• No AC Power	• Make certain that AC power cord firmly connected to the **AC Power Cord Socket** 19 and is plugged into a live outlet • Check to see whether outlet is switch-controlled
Display lights, but there is no sound or picture	• Intermittent input connections • **Mute** is on • Volume control is down	• Make certain that all input and speaker connections are secure • Press **Mute Button** 45 S • Turn up volume control
Unit turns on, but front-panel display does not light up	• Display brightness is turned off	• Follow the instructions in the Dim and Display Brightness sections on pages 41 and 42 so that the display is set to VFD FULL
No sound from any speaker; light around power switch is red	• Amplifier is in protection mode due to possible short • Amplifier is in protection mode due to internal problems	• 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	• Incorrect surround mode • Input is monaural • Incorrect configuration • Stereo or Mono program material	• 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 nonencoded programs
Unit does not respond to remote commands	• Weak batteries in remote • Wrong device selected • Remote sensor is obscured	• Change remote batteries • Press the AVR selector • Make certain front-panel sensor is visible to remote or connect remote sensor
Intermittent buzzing in tuner	• Local interference	• 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	• Digital audio feed paused	• Resume play for DVD • Check that Digital Input is selected
Fan does not appear to operate	• Additional cooling may not be required	• 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 445, 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 445's entire system memory including tuner presets, output level settings, delay times and speaker configuration data, first put the unit in the Standby mode 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 3 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, and 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.

APPENDIX

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 matrix surround technology which 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 create 7.1 sound fields from 5.1 digital soundtracks.
Logic 7 Cinema Logic 7 Music	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 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 seems 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 nonencoded, two-channel stereo program is being played.
DTS 96/24	DTS 96/24 is available on specially encoded (and labeled) optical discs that offer five channels of audio with a 96kHz sampling rate that delivers greatly improved audio performance. When a DTS 96/24 disc is in use and the player is connected with a digital link, this mode is selected automatically.
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 (DH)	Dolby Headphone enables ordinary stereo headphones to portray the sound of a five-speaker surround-playback system.

For additional information on the specifics of surround modes and processing, information about Dolby modes may be found at www.dolby.com. Information about DTS modes is available at www.dtsonline.com.

SYSTEM DEFAULTS

The two tables in this section show the factory default settings for all inputs to give you a picture of the AVR 445's initial settings. You may then decide whether any item needs to be changed so that it is more appropriate for your specific installation. Any of the settings shown may be changed as shown in the pages of the System Configuration section of this manual (pages 20–33).

TABLE 1: INPUT DEFAULTS

INPUT	AUDIO INPUT	VIDEO INPUT	COMPONENT VIDEO INPUT	RECORD OUTPUT
Video 1	ANALOG	AUTO	OFF	ANALOG
Video 2	ANALOG	AUTO	OFF	ANALOG
Video 3	OPTICAL 1	AUTO	COMPONENT 1	ANALOG
Video 4	ANALOG	AUTO	COMPONENT 2	ANALOG
DVD	COAX 1	AUTO	COMPONENT 3	ANALOG
HDMI 1	OPTICAL 3	HDMI 1	---	DSP DOWNMIX
HDMI 2	COAX 3	HDMI 2	---	DSP DOWNMIX
Tuner	ANALOG	AUTO	OFF	ANALOG
XM	---	AUTO	OFF	ANALOG
CD	ANALOG	AUTO	OFF	ANALOG
Tape	ANALOG	AUTO	OFF	ANALOG
DMP/The Bridge	ANALOG	AUTO	OFF	ANALOG
6/8 CH Direct	ANALOG	AUTO	OFF	ANALOG
USB	---	AUTO	OFF	DSP DOWNMIX

System Default and Personal Settings Worksheets

The worksheets in this section show the system defaults for the global settings on your AVR 445. Once your system is configured manually, or through the use of EzSet/EQ II, where applicable, we recommend that you use the "Your System Settings" column to record your personal preferences so that they may be restored in the event the AVR's memory is lost due to an extended power outage, system upgrade, processor reset, or other major service to your unit. Additional copies of this worksheet may be downloaded from the Harman Kardon Web site at www.harmankardon.com.

Worksheet A: Surround Configuration Defaults and Settings

Feature	System Default	Your System Settings
Logic 7 Global	Off	
Default Surround	Original	
Dolby Pro Logic II Music Center Width	3	
Dolby Pro Logic II Music Dimension	0	
Dolby Pro Logic II Panorama	Off	
Dolby Pro Logic IIx Music Center Width	3	
Dolby Pro Logic IIx Music Dimension	0	
Dolby Pro Logic IIx Panorama	Off	
Night Mode	Off	

APPENDIX

System Default and Personal Settings Worksheets

Worksheet B: Delay Defaults and Setting

Feature	System Default	Your System Settings
Front Left	12.0 Feet	
Center	12.0 Feet	
Front Right	12.0 Feet	
Surround Right	10.0 Feet	
Surround Back Right	10.0 Feet	
Surround Back Left	10.0 Feet	
Surround Left	10.0 Feet	
Subwoofer	12.0 Feet	

Worksheet C: System Defaults and Settings

Feature	System Default	Your System Settings
Front L/R Speaker Size & X-Over	Small – 100Hz	
Center Speaker Size & X-Over	Small – 100Hz	
Surround L/R Speaker Size & X-Over	Small – 100Hz	
Surround Back Speaker Size & X-Over	None	
LFE LP Filter	100Hz	
Sub Mode	Sub	
Channel Adjust	Global	
Sub Size	10 in/250mm	
VFD Fade Time Out	Off	
VFD Brightness	Full	
Volume Default	Off	
Volume Default Set	–25dB	
Semi-OSD Time Out	5 Sec	
Full-OSD Time Out	20 Sec	
DMP Auto Power	Off	
Surround Back Amps	Main	
Carrier Out	Zone II	

System Default and Personal Settings Worksheets
Worksheet D: Input Settings

FEATURE	DVD	Video 1	Video 2	Video 3	Video 4	HDMI 1	HDMI 2	CD	Tape	Tuner	The Bridge	USB	6/8 Ch Direct
Input Title													
Surround Mode													
Audio In Port													
Audio Auto Poll													
Video In Port													
Component Video Input													
Video Processing													
A/V Sync Delay													
Record Output													
Auto Poll													
ADC Sampling													
Tone In/Out													
Bass													
Treble													

AVR 445 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	
Dolby Pro Logic	40dB
Dolby Digital	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	1V p-p/75 ohms
Output Level/Impedance	1V p-p/75 ohms
Video Frequency Response (Composite and S-Video)	10Hz–8MHz (–3dB)
Video Frequency Response (Component Video)	10Hz–60MHz (–3dB)

General

Power Requirement	AC 120V/60Hz	
Power Consumption	120W at Power On, idle; 1,025W at rated power output (7 channels driven)	
Dimensions	Product	Shipping
Width	17-5/16 inches (440mm)	20-1/16 inches (510mm)
Height	6-1/2 inches (165mm)	10 inches (254mm)
Depth	17-1/16 inches (435mm)	22-3/16 inches (565mm)
Weight	39 lb (17.7kg)	46 lb (20.9kg)

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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RealPlayer is a registered trademark of RealNetworks.

Winamp is a registered trademark of America Online, Inc.

TiVo is a registered trademark of TiVo Inc.

Supplied Accessories

The AVR 445 is supplied with the following accessory items. If any item is missing, please contact Harman Kardon customer service at www.harmankardon.com.

- Six AAA batteries
- System remote control
- ZR 10 remote control
- Set/EQ™ microphone
- Extender rod for microphone
- AM loop antenna
- FM wire antenna
- AC power cord

Please register your product on our Web site at www.harmankardon.com. NOTE: You'll need the serial number of your AVR. At the same time, you can choose to be notified about our new products and/or special promotions.

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