harman/kardon

AVR354

7 X 75W 7.1 CHANNEL A/V RECEIVER

<div style="border:1px solid">

SERVICE MANUAL

</div>

CONTENTS

Released 2008

Discontinued XXXX

Rev0   5/2008

ELECTROSTATICALLY SENSITIVE (ES) DEVICES

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field effect transistors and semiconductor "chip" components.

The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge build-up or exposure of the assembly.

3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.

4. Use only an anti-static solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.

5. Do not use freon-propelled chemicals. These can generate electrical change sufficient to damage ES devices.

6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material.)

7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   CAUTION : Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together or your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES devices.

PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing.

Components identified with the IEC symbol ⚠ in the parts list are special significance to safety. When replacing a component identified with ⚠ , use only the replacement parts designated, or parts with the same ratings or resistance, wattage, or voltage that are designated in the parts list in this manual. Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed o.5mA.
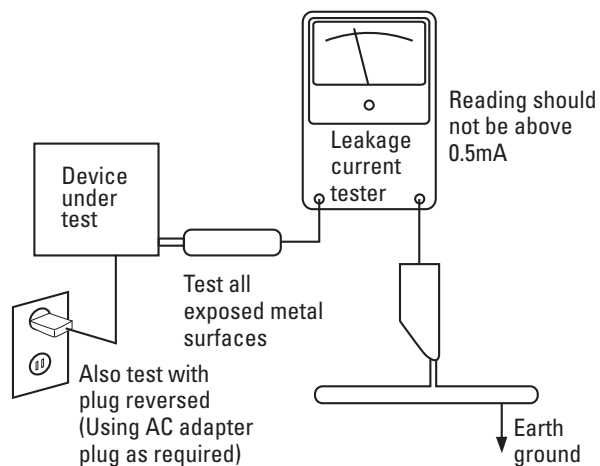
AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

AVR 354 TECHNICAL SPECIFICATIONS

Audio Section

Stereo Mode
Continuous Average Power (FTC)

> 75 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:
> 75 Watts per channel
> @ <0.07% THD, 20Hz–20kHz into 8 ohms
>
> Center channel:
> 75 Watts @ <0.07% THD, 20Hz–20kHz into 8 ohms
>
> Surround (L & R Side, L & R Back) channels:
> 75 Watts per channel
> @ <0.07% THD, 20Hz–20kHz into 8 ohms

Input Sensitivity/Impedance
> Linear (High-Level)   200mV/47k ohms

Signal-to-Noise Ratio (IHF-A)   100dB

Surround System Adjacent Channel Separation
> Pro Logic® I/II   40dB
>
> Dolby® Digital (AC-3)   55dB
>
> DTS®   55dB

Frequency Response
> @ 1W (+0dB, −3dB)   10Hz −130kHz

High Instantaneous
Current Capability (HCC)   ±35 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

Made for iPod

AM Tuner Section
> Frequency Range   520–1720 kHz
> Signal-to-Noise Ratio   45dB
> Usable Sensitivity   Loop 500μV
> Distortion   1kHz, 50% Mod 0.8%
> Selectivity   ±10kHz, 30dB

Video Section
> Television Format   NTSC
> Input Level/Impedance   1Vp-p/75 ohms
> Output Level/Impedance   1Vp-p/75 ohms
> Video Frequency Response
> (Composite and S-Video)   10Hz–8MHz (−3dB)
>
> Video Frequency Response
> (Component Video)   10Hz–100MHz (−3dB)
> HDMI™   Version 1.3a with 10-bit Deep Color

General
> Power Requirement   AC 120V/60Hz
> Power Consumption   118W idle, 890W maximum
>   (7 channels driven)

	(Product)	(Shipping)
Dimensions		
Width	17-5/16 inches (440mm)	21-7/8 inches (555mm)
Height	6-1/2 inches (165mm)	10-1/2 inches (266mm)
Depth	15 inches (382mm)	18-5/16 inches (465mm)
	(Product)	(Shipping)
Weight	31.5 lb (14.3kg)	36.7 lb (16.7kg)

Depth measurement includes knobs, buttons and terminal connections.
Height measurement includes feet and chassis.
All features and specifications are subject to change without notice.

1. Instruction manual ass'y - Accessories

① POLY BAG	② CARD WARRANTY	③ AM LOOP ANTENNA ASS'Y	④ BATTERY ASS'Y
⑤ MANUAL INSTRUCTION	⑥ FM 1 POLE ANT(UL)	⑦ REMOCON ASS'Y(ZONE2)	⑧ CORD,POEWR (UL)
⑨ SHEET GUIDE	⑩ STAPLE	⑪ COVER ASS'Y	⑫ IMAGE BROCHURES

Ⓐ REMOCON TRANSMITTER ASS'Y

Ⓑ MICROPHONE ASS'Y

NO		DESCRIPTION	PARTS NO.	Q,ty
1		POLY BAG		1
2		CARD WARRANTY	CQE1A172X	1
3		AM LOOP ANTENNA ASS'Y	CSA1A027Z	1
4		BATTERY		2
5		INSTRUCTION MANUAL		1
6		FM 1 POL ANT(UL)	CSA1A019Z	1
7		REMOCON ASS'Y(ZONE2)	CARTZONE24	1
8		CORD,POWER(UL)	CJA2A070Z	1
9		SHEET GUIDE	CQE1A381Z	1
10		STAPLE		3
11		COVER ASS'Y		1
	1	COVER A	CGR1A331H63	1
	2	COVER B	CBT1A332H63	1
	3	SHEET , FRONT COVER	CQE1A219Z	1
	4	PAD, COVER	CPS1A676	1
	5	BAG, POLY		1
12		IMAGE BROCHURES		1
A		REMOCON ASS'Y	RB46G00	1
B		MICROPHONE ASS'Y	CJXAVR340MICRO	1

2. Package Drawing

⑦ MICROPHONE ASS'Y
① MANUAL ASS'Y
② REMOCON ASS'Y
③ SNOW PAD (L)
④ SNOW PAD (R)
⑤ AVR354
⑧ Bridge2 ASS'Y
⑥ BOX ,OUT CARTON
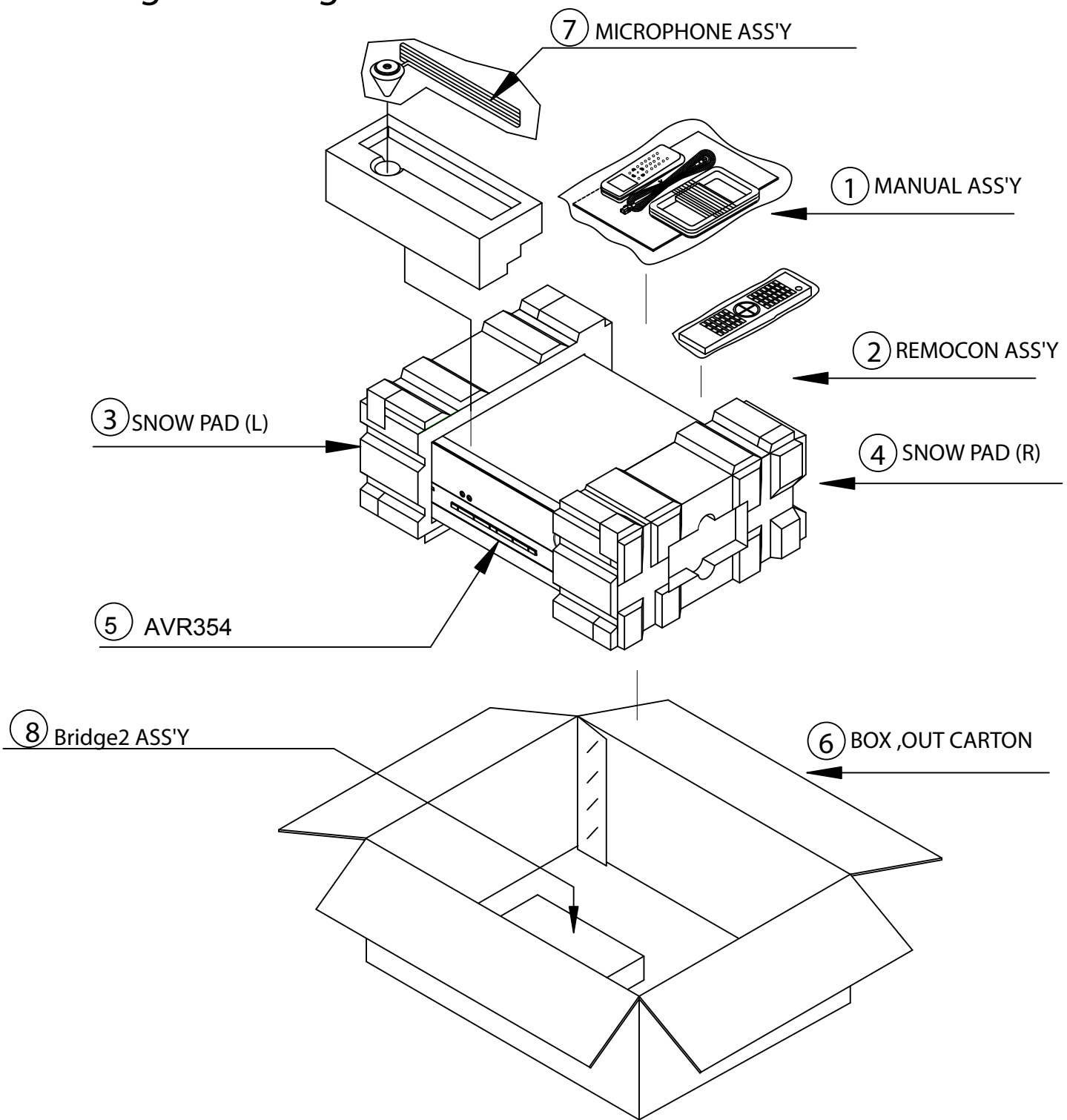
NO	DESCRIPTION	PARTS NO.	Q,ty
1	ACCESSORY		1
2	REMOCON ASS'Y	RB46G00	1
3	SNOW,PAD(L)	CPS5A564Z	1
4	SNOW,PAD(R)	CPS5A565Z	1
5	AVR354	AVR 354	1
6	BOX,OUT CARTON	CPG1A854W	1
7	MICROPHONE ASS'Y	CJXAVR340MICRO	1
8	BRIDGE 2 ASS'Y	THE BRIDGE II AVR	1

FRONT-PANEL CONTROLS

Main Power Switch: This mechanical switch turns the power supply on or off. It is usually left pressed in (On position), and cannot be turned on using the remote control.

Standby/On Switch: This electrical switch turns the receiver on for playback, or leaves it in Standby mode for quick turn-on using this switch or the remote control.

Power Indicator: This LED has three possible modes:

• **Main Power Off:** When the AVR is unplugged or the Main Power Switch is off, this LED is off.

• **Standby:** The LED is amber, indicating that the AVR is ready to be turned on.

• **On:** The LED is white, when the AVR is on and operating normally.

> **NOTE:** If the PROTECT message ever appears, turn off the AVR and unplug it. Check all speaker wires for a possible short. If none is found, bring the unit to an authorized Harman Kardon service center for inspection and repair before using it again.

Source List: Press this button to select a source device, which is a component where a playback signal originates, such as DVD, cable TV, satellite or the tuner.

Volume Knob: Turn this knob to raise or lower the volume.

Message Display: Various messages appear in this two-line display in response to commands and changes in the incoming signal. In normal operation, the current source name appears on the upper line, while the surround mode is displayed on the lower line. When the on-screen display menu system (OSD) is in use, the current menu settings appear.

Headphone Jack/EzSet/EQ Microphone Input: Plug a 1/4" headphone plug into this jack for private listening.

This jack is also used to connect the supplied microphone for the EzSet/EQ procedure described in the Initial Setup section. To begin EzSet/EQ, plug the supplied microphone into this jack, place the microphone at the listening position, and follow the directions given in the Speaker Setup-Automatic Setup-EzSet/EQ on-screen menu.

Surround Modes: Press this button to select a surround sound (e.g., multichannel) mode. The Surround Modes menu will appear on screen, and the menu line will appear in the front-panel display.

Use the front-panel or remote ▲/▼ Buttons to highlight a different menu line: Auto Select, Virtual Surround, Stereo, Movie, Music or Video Game. Each line represents a type of audio signal, and is set to the preferred surround mode that you manually select.

Press the OK Button when the menu line is highlighted, and the available surround mode options for the current signal will appear. Use the ▲/▼ Buttons to select the desired mode, and press the OK Button to engage it. Press the Back/Exit Button to exit the Surround Modes menu.

See the Advanced Functions section for more information on surround modes.

Analog Audio, Video and Digital Audio Inputs: Connect a source component that will only be used temporarily, such as a digital camera or game console, to these jacks. Use only one type of audio and one type of video connection.

> **NOTES:**
>
> • Each of these connections (analog audio, digital audio and video) may be independently assigned to any source. See the Initial Setup section for information on setting up sources, including assigning audio and video inputs to a source.
>
> • Although these jacks are labeled Optical 4, Coaxial 3 and Video 4 on the AVR, the AVR's menus refer to them as the Optical Front, Coaxial Front, Composite Front, S-Video Front and Analog Front inputs.

Speaker/Channel Input Indicators: The box icons indicate which speaker positions you have configured (see the Initial Setup Section), and the size (frequency range) of each speaker. The letters will light inside the boxes to indicate which channels are present in the incoming signal.

Navigation: These buttons are used to navigate the AVR's menus and to operate the tuner.

Remote IR Sensor: This sensor receives infrared (IR) commands from the remote control. It is important to ensure that it is not blocked. If covering the sensor is unavoidable, such as when the AVR 354 is placed inside a cabinet, you may use an optional Harman Kardon HE 1000, or other infrared receiver, connecting it to the Remote IR Input on the AVR 354's rear panel. Alternatively, connect the Remote IR Output of another compatible component to the AVR 354's Remote IR Input. Point the remote at the other device's remote sensor, and the command will be transmitted to the AVR 354. An external IR "blaster" may also be used, positioned to point at this area.

AVR Settings Button: Press this button to access the AVR's main menu.

Info Settings Button: Press this button to directly access the AVR's Source Info submenu, which contains the settings for the current source.

Resolution: Each press of this button changes the AVR's video output resolution to these settings: 480i, 480p, 720p, 1080i or 1080p.

> **IMPORTANT NOTE:** If the AVR's video output resolution is set higher than the capabilities of the actual connection, you will not see a picture. If the best video connection from the AVR to the TV is either composite or S-video, press this button until the resolution is set to 480i.

Audio Effects: Press this button to directly access the Audio Effects submenu, which allows adjustment of the tone and other controls. See the Initial Setup section for more information.

Video Modes: Press this button for direct access to the Video Modes submenu, which contains settings that may be used to improve the picture if necessary after you have adjusted the picture settings using the video display or TV.

OK: Press this button to select the currently highlighted item.

Back/Exit: Press this button to return to the previous menu, or to exit the menu system.
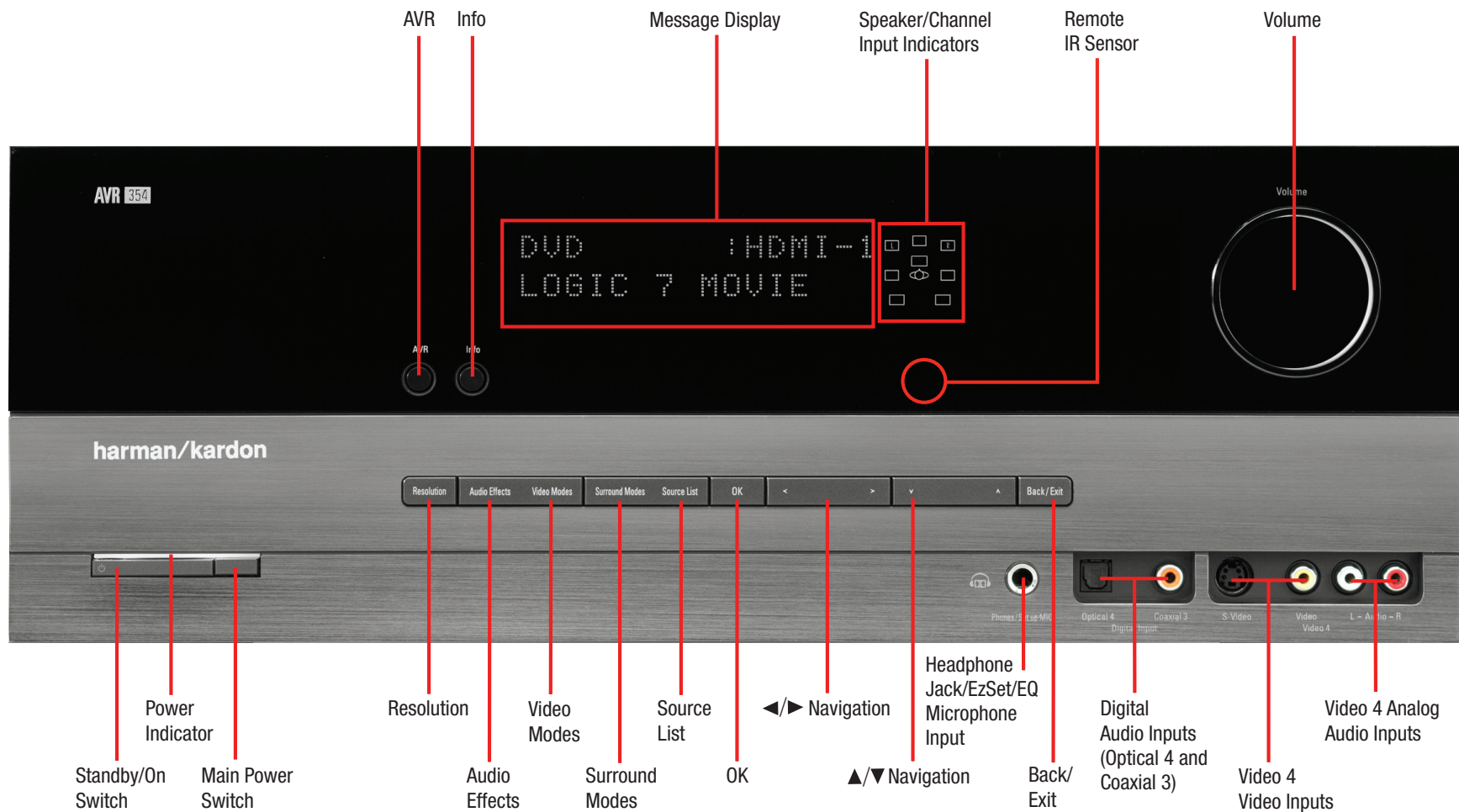
AVR Info Message Display Speaker/Channel
Input Indicators Remote
IR Sensor Volume

DVD   :HDMI-1
LOGIC 7 MOVIE

Power
Indicator Resolution Video
Modes Source
List ◄/► Navigation Headphone
Jack/EzSet/EQ
Microphone
Input Digital
Audio Inputs
(Optical 4 and
Coaxial 3) Video 4 Analog
Audio Inputs

Standby/On
Switch Main Power
Switch Audio
Effects Surround
Modes OK ▲/▼ Navigation Back/
Exit Video 4
Video Inputs

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

REAR-PANEL CONNECTIONS

AM and FM Antenna Terminals: Connect the included AM and FM antennas to their respective terminals for radio reception.

XM Antenna Jack: Plug in an XM Connect and Play or Mini Tuner antenna module here. The XM antenna module is purchased separately, and should specify that it is for home use with an XM Ready® product. You will need to subscribe to the XM service, which is available separately, and activate the service for your antenna module. (XM service is not available in Alaska and Hawaii.)

Front, Center and Surround Speaker Outputs: Use two-conductor speaker wire to connect each set of terminals to the correct speaker. Remember to observe the correct polarity (positive and negative connections). Always connect the positive lead to the colored terminal on the receiver and the red terminal on the speaker. Connect the negative lead to the black terminal on both the receiver and the speaker. See the Connections section for more information on connecting your speakers.

Surround Back/Zone 2 Speaker Outputs: These speaker outputs are used for the surround back channels in a 7.1-channel home theater, or may be reassigned to a remote room for multizone operation. When these outputs are reassigned for multizone operation, only a 5.1-channel configuration will be available in the main listening room. Use the on-screen menu system to configure these channels as desired.

As with the other speaker outputs, remember to observe proper polarity by connecting the positive and negative output terminals to the corresponding terminals on each speaker.

Subwoofer Output: If you have a powered subwoofer with a line-level input, connect it to this jack.

Preamp Outputs: Connect these jacks to an external amplifier if more power is desired.

The Surround Back/Zone 2 Preamp Outputs may be used with an external amplifier to power the surround back channels, or to power the remote zone of a multizone system. Use the on-screen menu system to configure these channels as desired.

Remote Infrared (IR) Input and Output: When the remote IR receiver on the front panel is blocked, such as when the AVR is placed inside a cabinet, connect an optional IR receiver to the Remote IR Input jack for use with the remote control. The Remote IR Output may be connected to the Remote IR Input of a compatible product to enable remote control through the AVR. This is particularly useful in multizone applications to control a source device from the remote room (when used with the Zone 2 IR Input). When several source devices are used, connect them in "daisy chain" fashion.

Zone 2 Infrared (IR) Input: Connect a remote IR receiver located in the remote zone of a multizone system to this jack to control the AVR (and any source devices connected to the Remote IR Output) from the remote zone.

Remote IR Carrier Output: This output is similar in function to the Remote IR Output, with the difference that this jack outputs the full infrared signal as received by the AVR's IR sensor or the Remote IR

Input, while the Remote IR Output jack outputs a "stripped" signal that has no carrier frequency. The full signal may be required by some components with IR inputs. It may also be required when you connect external IR emitters or other devices to the AVR to pass IR signals to other components.

Composite and S-Video 1, 2 and 3 Video Inputs: These jacks may be used to connect your video-capable source components (e.g., VCR, DVD player, cable TV box) to the receiver. Use only one type of video connection for each source. These inputs are assignable, which means they may be paired with any analog or digital audio inputs. This will be explained in more detail in subsequent sections of this manual.

> **NOTE:** The Video 2 inputs are associated with a set of outputs. Consider connecting a video recorder here.

Composite and S-Video 2 Outputs: Connect one of these analog video outputs to the composite or S-video inputs of a recording device. A signal is available at these outputs whenever an analog video source is playing. HDMI and component video signals are not available for recording.

Composite and S-Video Monitor Outputs: If any of your sources use composite or S-video connections, connect one or both of these monitor outputs to the corresponding inputs on your television or video display. If your video display is equipped with HDMI or component video inputs, these connections are unnecessary. Connect the HDMI Monitor Output (if available, otherwise use the Component Video Monitor Output) to your TV, and the AVR 354 will convert the composite or S-video source signal to the correct format for a single video cable connection to the TV.

HDMI Inputs and Output: HDMI (High-Definition Multimedia Interface) is a connection for transmitting digital audio and video signals between devices. With the AVR 354's powerful processor, you may connect up to three HDMI-equipped source devices to the HDMI inputs using a single-cable connection, while benefiting from superior digital audio and video performance. If your video display is not HDMI-compatible, connect the device to one of the analog video inputs, then pair it with an analog or digital audio input.

If your video display has an HDMI input, make just the HDMI video connection to your display; the AVR 354 will automatically transcode analog video signals to the HDMI format, upscaling to as high as 1080p.

Analog 1–5: Connect the left and right analog audio outputs of a source device to any of these inputs. These inputs are assignable, which means they may be paired with any video inputs, as explained in subsequent sections of this manual.

> **NOTES:**
> • The Analog 3 through 5 connectors physically line up below the Video 1 through 3 (composite and S-video) connectors. For convenience, consider using Analog 3 with Video 1, Analog 4 with Video 2 and Analog 5 with Video 3, if appropriate for your system.

FM Antenna

AM Antenna

S-Video
1, 2 and 3

S-Video 2
Output

Composite 2
Output

Composite
1, 2 and 3

Video
Monitor
Outputs

HDMI
1, 2 and 3

The Bridge II

XM
Antenna

HDMI
Monitor
Output

Component
1, 2 and 3

Component Video
Monitor Outputs

AC Power
Input

Analog 2
Outputs

Zone 2
Audio
Outputs

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK,
DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.
AVERTISSEMENT: AFIN D'ÉVITER LES DANGERS D'INCENDIE
ET D'ÉLECTROCUTION, NE PAS EXPOSER CET APPAREIL
À LA PLUIE NI À L'HUMIDITÉ.

CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
AVIS : RISQUE DE CHOC
ÉLECTRIQUE-NE PAS OUVRIR

MODEL NO. AVR 354
harman/kardon®
NORTHRIDGE
CALIFORNIA, USA
MADE IN CHINA

Apparatus Claims of U.S. Patent Nos.
6,836,549; 6,381,747; 7,050,698; 6,516,132;
and 5,583,936 licensed for limited viewing
uses only.

Manufactured under license from Dolby
Laboratories. Dolby and the double-D
symbol are trademarks of Dolby
Laboratories. Copyright 1999-2004 Dolby
Laboratories. All rights reserved.

Manufactured under license under U.S.
Patent #'s: 5,451,942; 5,956,674; 5,974,380;
5,978,762; 6,226,616; 6,487,535 & other
U.S. and worldwide patents issued &
pending. DTS is a registered trademark &
the DTS logos and symbol are
trademarks of DTS, Inc © 1996-2007 DTS,
Inc. All Rights Reserved.

The XM and related logos are registered
trademarks of XM Satellite Radio Inc.

This class B digital apparatus complies
with Canadian ICES-003. Cet appareil
numérique de la classe B est conforme
à la norme NMB-003 du Canada.

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 any interference received, including interference that may cause undesired operation.

Remote
IR Input

Preamp
Outputs

Analog 4
Outputs

Remote
IR Output

Front Speaker
Outputs

6-/8-
Channel
Inputs

Coaxial
Digital
Audio
Output

Coaxial
1 and 2
Digital
Audio

Switched AC
Accessory
Outlet

RS-232
Reset

RS-232
Mode

Analog 1-5
Inputs

Carrier
IR Output

Subwoofer
Output

Zone 2
IR Input

Surround
Back/Zone 2
Speaker Outputs

Surround
Speaker
Outputs

Center Speaker
Outputs

Optical 1, 2 and 3
Digital Audio

RS-232
Serial Port

NOTE: To make it easier to follow the instructions throughout the manual that refer to this illustration, a copy of this page may be downloaded from the Product Support section at www.harmankardon.com. All connectors are inputs except as indicated.

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REAR-PANEL CONNECTIONS

- The Analog 1 and 2 connectors don't physically line up with any analog video inputs. Consider using them for audio-only devices, such as a CD player or cassette tape deck.

- The Analog 2 and 4 inputs are each associated with a set of outputs. Consider using the Analog 2 connectors for an audio recorder, and the Analog 4 connectors for a video recorder (along with the Video 2 connectors).

- You may optionally connect a source to both an analog and digital audio input. This is useful for making recordings, for multizone applications or simply as a backup.

Analog 2 and 4 Outputs: Connect either of these analog audio outputs to the analog audio inputs of a recording device. A signal is available at these outputs whenever an analog audio source is playing. However, the AVR 354 does not convert digital audio sources to analog for recording.

Coaxial 1/2 and Optical 1/2/3 Digital Audio Inputs: If a source has a compatible digital audio output, and if you are not using an HDMI connection for audio for the device, connect it to one of these jacks to hear digital audio formats, such as Dolby Digital, DTS and linear PCM. Use only one type of digital audio connection for each source.

Coaxial Digital Audio Output: If a source is also an audio recorder, connect a coaxial digital audio output to the recorder's input for improved recording quality. Only PCM digital audio signals are available for recording.

The Bridge II Input: Connect the included Harman Kardon The Bridge II to this input for use with your iPod, iPod touch or iPhone (none of which are included). Make sure the receiver is turned off (in Standby mode) when connecting The Bridge II.

6-/8-Channel Inputs: Connect the multichannel analog audio outputs of a DVD-Audio, SACD™, Blu-ray Disc™ or HD-DVD™ player (or any other external decoder) to these jacks to enjoy these formats.

> NOTE: When the multichannel player has an onboard digital decoder, it is not necessary to connect it to the 6-/8-Channel Analog Audio Inputs. Only a digital audio connection (HDMI, coaxial or optical) is needed.

Zone 2 Audio Outputs: Connect these jacks to an external amplifier to power the speakers in the remote zone of a multizone system. When these jacks are used, it is possible to have a full 7.1-channel system in the main listening room at the same time the multizone system is in use.

Component Video 1, 2 and 3 Inputs: If a video source (e.g., DVD player or HDTV tuner) has analog component video (Y/Pb/Pr) capability, and if you are not using an HDMI connection for the device, then connect the component video outputs of the source to one of the sets of component video inputs. Do not make any other video connections to that source.

Component Video Monitor Outputs: If you are using one of the Component Video Inputs and your television or video display is component-video-capable, and if you are not connecting the HDMI

Output to your display, connect these jacks to the corresponding inputs on your video display.

> NOTES:
> - Due to copy-protection restrictions, there is no output at the Component Video Monitor Outputs for copy-protected sources.
> - Composite and S-video signals are upscaled to as high as 1080i and available at these outputs. If your video display's best connection is component video, it is the only video connection required from the AVR to the display.

RS-232 Serial Port: This specialized connector may be used with your personal computer in case we offer a software upgrade for the receiver at some time in the future.

RS-232 Mode: Leave this switch popped out in the Operate position unless the AVR 354 is being upgraded.

RS-232 Reset: This switch is only used during a software upgrade. A standard processor reset is performed by pressing and holding the front-panel OK Button.

Switched AC Accessory Outlet: You may plug the AC power cord of one source device into this outlet, and it will turn on whenever you turn on the receiver. Do not use a source that consumes more than 50 watts of power.

AC Power Input: After you have made all other connections, plug the AC power cord into this receptacle and into an unswitched wall outlet.

MAIN REMOTE CONTROL FUNCTIONS

The AVR 354 remote is capable of controlling 7 devices, including the AVR itself and an iPod or iPhone docked in the included The Bridge II. During the installation process, you may program the codes for each of your source components into the remote. Each time you wish to use the codes for any component, first press its Selector button. This changes the button functions to the appropriate codes.

Each Source Selector has been preprogrammed to control certain types of components, with only the codes specific to each brand and model changing, depending on which product code is programmed. The AUX Source Selector may be used for any of five device types: a CD player, an HDTV set-top box, a PVD recorder used with cable or satellite television, a TiVo® set-top box or a VCR. The device mode will depend on the product code programmed into the AUX Source Selector as described in the Initial Setup section. CD players use codes beginning with a 0, 1 or 2; VCRs use codes beginning with a 3 or 4; HDTV set-top boxes use codes beginning with a 6; PVDs use codes beginning with a 7 and TiVo set-top boxes use codes beginning with an 8. The remote automatically switches to the correct device mode, and it will operate the device as described in the function list in Table A13 in the appendix.

Similarly, the CBL/SAT Source Selector automatically selects cable or satellite television operation depending on the first digit of the product code: 0, 1 or 2 for cable and 3 or 4 for satellite boxes.

IMPORTANT NOTE: All of the AVR 354's audio and video inputs are independently assignable. As explained in the Initial Setup section, it is necessary to set up each source, which includes selecting the inputs to which the device is physically connected. Any device may be connected to any compatible input and given any name (e.g. DVD or Game). The Source Selectors' device types may be changed. For example, the TV Source Selector may be reprogrammed to operate a DVD player.

Most of the buttons on the remote have dedicated functions, although the precise codes transmitted will vary depending on which source device has been selected for operation. Due to the wide variety of functions unique to various source devices, we have included only a few of the most-often used functions on the remote, including alphanumeric keys, transport controls, television-channel control, menu access and power on and off. Please refer to the descriptions below for more specific information.

Some buttons are only used to operate the AVR, and their functions are available at any time, even if the remote has been switched to another device's mode: AVR Power On and Off, Audio Effects, Video Modes, Surround Modes, Volume, Mute and Sleep Settings. Press the AVR Settings button near the bottom of the remote to return it to AVR mode.

Any given button may have different functions, depending on which component is being controlled. Some buttons are labeled with these functions. For example, the Page Up/Down Buttons are labeled for use as Channel Up/Down Buttons when controlling a television or cable box. See Table A13 in the appendix for listings of the different functions for each type of component.

IR Transmitter Lens: As buttons are pressed on the remote, infrared codes are emitted through this lens. Make sure it is pointing toward the component being operated.

AVR Power On Button: Press this button to turn on the AVR. The Master Power Switch on the AVR 354's front panel must first have been switched on.

Device Power Off Button: When the remote has been switched to a device's mode by pressing its Source Selector, press this button to turn off the device.

Device Power On Button: When the remote has been switched to a device's mode by pressing its Source Selector, press this button to turn on the device.

Mute Button: Press this button to mute the AVR 354's speaker and headphone outputs temporarily. To end the muting, press this button or adjust the volume. Muting is also canceled when the receiver is turned off.

AVR Power Off Button: Press this button to turn off the AVR 354.

Source Selectors: Press one of these buttons to select a source device, which is a component where a playback signal originates, e.g., DVD, CD, cable TV, satellite or HDTV tuner. This will also turn on the receiver and switch the remote's mode to operate the source device. The first press of the Radio Selector switches the AVR to the last-used tuner band (AM, FM or XM). Each successive press changes the band.

Audio Effects: This button is only used to operate the AVR. Press it to directly access the Audio Effects submenu, which allows adjustment of the tone and other controls. Each successive press scrolls to the next line in the menu. See the Initial Setup section for more information.

Video Modes: This button is only used to operate the AVR. Press it for direct access to the Video Modes submenu, which contains settings that may be used to improve the picture if necessary after you have adjusted the picture settings using the video display or TV. Each successive press scrolls to the next line in the menu. See the Advanced Functions section for more information.

Surround Modes: This button is only used to operate the AVR. Press it to directly access the Surround Modes submenu. Each successive press scrolls to the next line in the menu, or use the ▲/▼ Buttons to scroll to the next line: Auto Select, Virtual Surround, Stereo, Movie, Music or Video Game. Each menu line represents a type of audio signal, and is set to the preferred surround mode that you manually select.

Press the OK Button when the menu line is highlighted, and the available surround mode options for the current signal will appear. Use the ▲/▼ Buttons to select the desired mode, and press the OK Button to engage it. Press the Back/Exit Button to exit the Surround Modes menu and display the next higher menu in the hierarchy.

See the Advanced Functions section for more information on surround modes.

Sleep Settings Button: Press this button to activate the sleep timer, which turns off the receiver after a programmed period of time of up to 90 minutes. Each successive press increases the timer by 10 minutes, ending with the "Sleep Off" message.

MAIN REMOTE CONTROL FUNCTIONS

Volume Control: Press this button to raise or lower the volume.

Navigation (▲/▼/◄/►) and **OK Buttons:** These buttons are used to make selections within the menu system. These buttons are also used to operate the tuner.

Alphanumeric Keys: Use these buttons to enter numbers for radio station frequencies or to select station presets. Use the alphabetic keys with other products as required. When prompted for a text entry, the first press of the key displays the first letter printed above the key. Each additional press displays the other letters. When the desired letter appears, wait a moment for it to be entered before moving to the next character.

Last Channel: When controlling a cable, satellite or HDTV set-top box or a TV, press this button to return to the previous television channel.

Activity: This button may be programmed to transmit a series of commands with a single press, which is useful for powering on all devices and selecting the correct settings on each device, or for selecting multi-digit channels with a single press. See the Advanced Functions section for more information on Activities.

Back/Exit: Press this button to return to the previous menu or to exit the menu system. This button may have the same effect with some source devices.

Menu Button: This button is used to display the main menu on some source devices. To display the AVR 354's main menu, press the AVR Settings Button.

Disc Menu: While a DVD is playing, press the DVD Source Selector, then this button, to display the disc's menu.

Teletext Buttons: Use these buttons with a Teletext-capable television if your broadcast, cable or satellite provider offers Teletext service. They are normally not used in North America. These buttons are also used to operate some source devices. See Table A13 in the appendix for details.

Channel/Page Control: When the tuner has been selected, this control selects a preset radio station. Press these buttons while operating a cable, satellite or HDTV set-top box or a television to change channels. The Page control may be available with some DVD players when playing a DVD Audio disc containing pages of images associated with a track.

Record Button: Use this button to make recordings when an audio or video recorder is in use.

AVR Settings Button: Press this button to display the AVR's Main Menu. It is also used to switch the remote's device mode from a source device to the AVR.

Info Settings Button: Press this button to display the AVR's Info Menu, which contains the settings for the current source.

Source Settings Button: Press a Source Selector and then this button to display a source device's settings menu.

Zone Selector: Use this switch to select whether AVR commands will affect the main listening area (Zone 1) or the remote zone of a multizone system (Zone 2). For normal operation, leave the switch in the Zone 1 position.

Track Skip: These buttons have no effect on the receiver, but are used with source components to change tracks or chapters.

Transport Controls: These buttons have no effect on the receiver, but are used to control many source components.

Light: Press this button to illuminate the buttons on the remote. Press it again to turn the backlight off, or wait ten seconds after the last button press for the light to turn off on its own.

Learn: The AVR 354 remote is capable of "learning" individual IR codes from the original remote that came with your TV or a device that is connected to any of the source inputs. See Step Eight of the Installation section for instructions on learning remote codes.
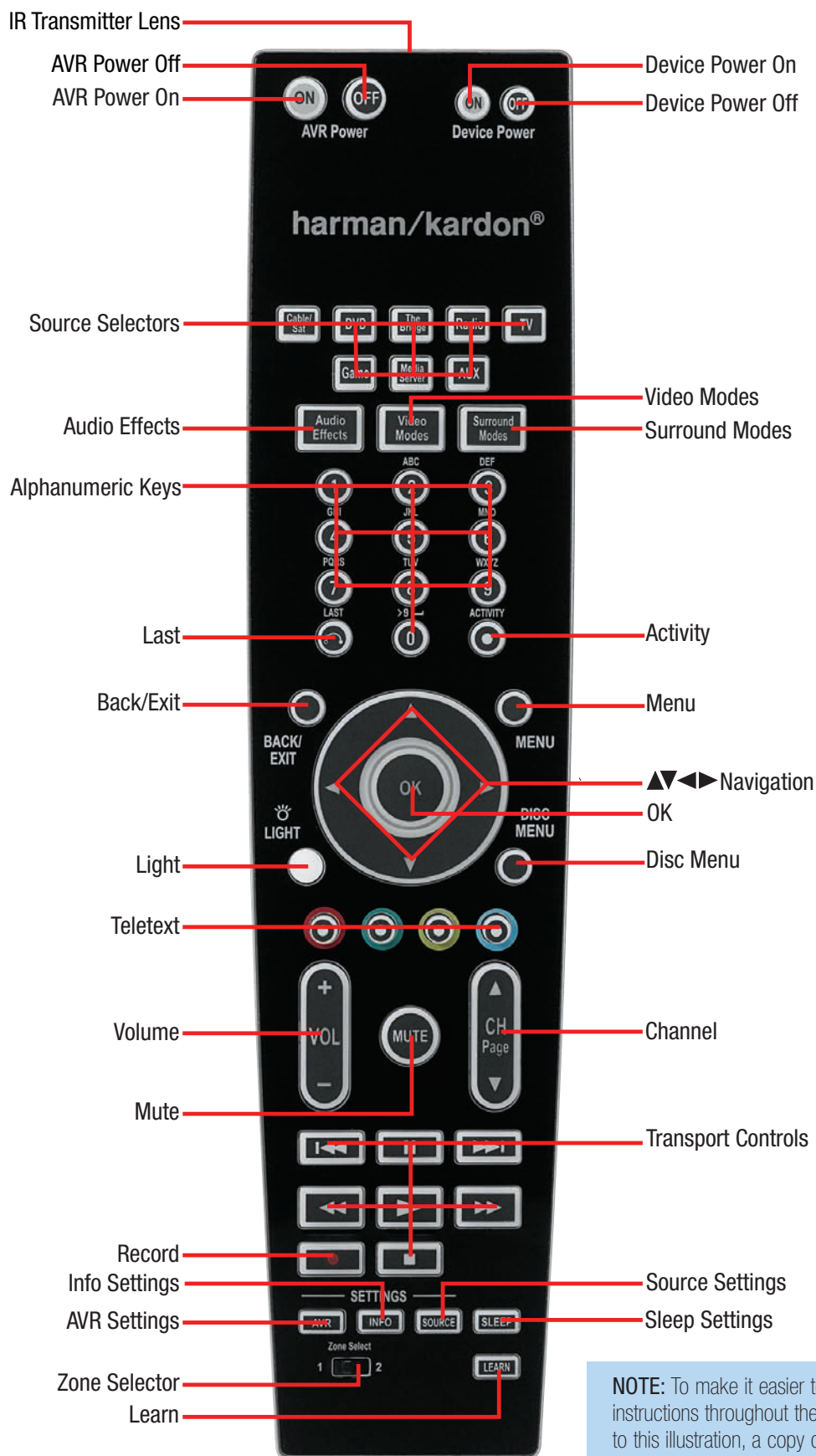
IR Transmitter Lens

AVR Power Off

AVR Power On

Device Power On

Device Power Off

AVR Power

Device Power

harman/kardon®

Source Selectors

Cable/Sat　DVD　The Bridge　Radio　TV

Game　Media Server　AUX

Video Modes

Audio Effects

Audio Effects　Video Modes　Surround Modes

Surround Modes

Alphanumeric Keys

ABC　DEF

GHI　JKL　MNO

PQRS　TUV　WXYZ

LAST　>9⌐　ACTIVITY

Last

Activity

Back/Exit

BACK/EXIT

Menu

MENU

OK

▲▼◄►Navigation

OK

LIGHT

DISC MENU

Light

Disc Menu

Teletext

Volume

VOL
+
−

MUTE

CH Page
▲
▼

Channel

Mute

Transport Controls

Record

Info Settings

SETTINGS

Source Settings

AVR Settings

AVR　INFO　SOURCE　SLEEP

Sleep Settings

Zone Select
1 ▢ 2

LEARN

Zone Selector

Learn

There are different types of audio and video connections used to connect the receiver to the speakers and video display, and to connect the source devices to the receiver. To make it easier to keep them all straight, the Consumer Electronics Association (CEA®) has established a color-coding standard. See Table 1.

Table 1 – Connection Color Guide

Audio Connections		
	Left	Right
Front **(FL/FR)**		
Center **(C)**		
Surround **(SL/SR)**		
Surround Back **(SBL/SBR)**		
Subwoofer **(SUB)**		
Digital Audio Connections		
Coaxial		
Optical	Input	
Video Connections		
Component	Y Pb	Pr
Composite		
S-Video		
HDMI™ Connections (digital audio/video)		
HDMI		

Types of Connections

This section will briefly review different types of cables and connections.

Speaker Connections

Speaker cables carry an amplified signal from the receiver's speaker terminals to each loudspeaker. Speaker cables contain two wire conductors, or leads, inside plastic insulation. The two conductors are usually differentiated in some way, by using different colors, or stripes, or by adding a ridge to the insulation. Sometimes the wires are different, colors e.g. copper-colored and silver.

The differentiation is important because each speaker must be connected to the receiver's speaker-output terminals using two wires, one positive (+) and one negative (–), referred to as speaker polarity. It's important to maintain the proper polarity for all speakers in the system, or performance can suffer, especially for the low frequencies.

Always connect the positive terminal on the loudspeaker, which is usually colored red, to the positive terminal on the receiver, which is colored as shown in the Connection Color Guide (Table 1). Similarly, always connect the black negative terminal on the speaker to the black negative terminal on the receiver.

The AVR 354 uses binding-post speaker terminals that can accept banana plugs or bare-wire cables. Banana plugs are simply plugged into the hole in the middle of the terminal cap. See Figure 1.
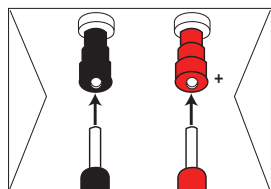
Figure 1 – Binding-Post Speaker Terminals With Banana Plugs

Bare wire cables are installed as follows (see Figure 2):

1. Unscrew the terminal cap until the pass-through hole in the collar is revealed.

2. Insert the bare end of the wire into the hole.

3. Hand-tighten the cap until the wire is held snugly.
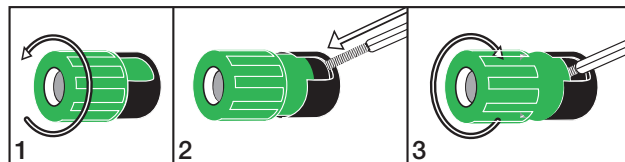
Figure 2 – Binding-Post Speaker Terminals With Bare Wires

Subwoofer

The subwoofer is a specialized type of loudspeaker used to play only the low frequencies (bass), which require much more power than the other speaker channels. In order to obtain the best results, most speaker manufacturers offer powered subwoofers, in which the speaker contains its own amplifier on board. Usually, a line-level (nonamplified) connection is made from the receiver's Subwoofer Output to a corresponding jack on the subwoofer, as shown in Figure 3, but sometimes the subwoofer is connected to the receiver using the front left and right speaker outputs, as with passive in-wall subwoofers, and then the front left and right speakers are connected to terminals on the subwoofer.

Although the subwoofer output looks similar to the analog audio jacks used for the various components, it is filtered and only allows the low frequencies to pass. Don't connect this output to any other devices. Although doing so won't cause any harm, performance will suffer.

Figure 3 – Subwoofer

Connecting Source Devices to the AVR

The AVR 354 is designed to process audio and video input signals, playing back the audio and displaying the video on a television or monitor connected to the AVR. These signals originate in what are known as "source devices," including your DVD player, CD player, DVR (digital video recorder) or other recorder, tape deck, game console, cable or satellite television box or MP3 player. Although the tuner is built into the AVR, it also counts as a source, even though no external connections are needed, other than the FM and AM antennas and the XM antenna module.

Separate connections are required for the audio and video portions of the signal, except for digital HDMI connections. The types of connections used depend upon what's available on the source device, and for video signals, the capabilities of your video display.

CONNECTIONS

Audio Connections

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

> **NOTE:** Since HDMI signals may carry both audio and video, if your video display device has an HDMI input, make a single HDMI connection from your source device (such as a DVD player) to the AVR. No separate digital audio connection is usually required. Make sure to turn the volume on your television all the way down.

Digital Audio

The AVR 354 is equipped with three HDMI (High-Definition Multimedia Interface) inputs, and one output. HDMI technology enables digital audio and video information to be carried using a single cable, thus delivering the highest quality picture and sound.

There are different HDMI versions, depending on the capability of the source device and the type of signal it is capable of transmitting.

In addition, receivers and processors such as the AVR 354 may handle the incoming signal in several different ways, depending on their capability as well. The AVR 354 uses HDMI version 1.3a, and is capable of processing both the audio and video components of the HDMI data, minimizing the number of cable connections in your system. Thanks to the higher bandwidth and speed of HDMI version 1.3a, the AVR 354 implements Deep Color, which increases by an order of magnitude the shades of color that can be displayed; and the latest lossless multichannel audio formats, including Dolby TrueHD and DTS-HD Master Audio.

> **NOTE:** Some DVD-Audio, SACD, Blu-ray Disc and HD-DVD players, output mulitchannel audio only through the source's multichannel analog outputs. For those devices, make a separate analog audio connection in addition to the HDMI connection, which is still used for video and to listen to Dolby Digital, DTS or PCM materials that may be stored on the disc.

In addition, the AVR 354 will convert analog video signals to the HDMI format, upscaling to high-definition 1080p resolution. You may view the AVR 354's own on-screen display menus using the HDMI output.

The physical HDMI connection is simple. The connector is shaped for easy plug-in (see Figure 4). If your video display has a DVI input and is HDCP-compliant, you may use an HDMI-to-DVI adapter (not included) to connect it to the AVR's HDMI Output, but a separate audio connection is required. HDMI cable runs are usually limited to about 10 feet, depending on the type of cable used.

Figure 4 – HDMI Connection

If your video display or source device is not HDMI-capable, use one of the analog video connections (composite, S- or component video) and, if available on your source device, either a coaxial or optical digital audio connection.

Coaxial digital audio jacks are usually color-coded in orange. Although they look similar to analog jacks, they should not be confused, and you should not connect coaxial digital audio outputs to analog inputs or vice versa. See Figure 5.

Figure 5 – Coaxial Digital Audio

Optical digital audio connectors are normally covered by a shutter to protect them from dust. The shutter opens as the cable is inserted. Input connectors are color-coded using a black shutter, while outputs use a gray shutter. See Figure 6.
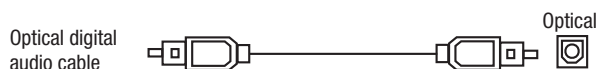
Figure 6 – Optical Digital Audio

Analog Audio

Analog connections require two cables, one for the left channel (white) and one for the right channel (red). These two cables are often attached to each other for most of their length. See Figure 7.

Most sources that have digital audio jacks also have analog audio jacks, although some older types of sources, such as tape decks, only have analog jacks. For sources that are capable of both digital and analog audio, you may make both connections.

The analog audio connection is strongly recommended if you intend to use the source with the multizone system. It's required if you will be using the multizone preamp outputs with an external amplifier to power your remote speakers, as the AVR 354's multizone system is not capable of converting the digital signal to analog format. It's suggested that you also use the analog audio connections when using the Surround Back/Zone 2 speaker outputs, in case another two-channel digital audio source is in use in the main listening area. The AVR 354 is only capable of processing one PCM source at a time.

You may only record materials from DVDs or other copy-protected sources, using analog connections. Remember to comply with all copyright laws, if you choose to make a copy for your own personal use.

Figure 7 – Analog Audio

Multichannel analog connections are used with some high-definition sources where the copy-protected digital content is decoded inside the source. These types of connections are usually used with DVD-Audio, SACD, Blu-ray Disc, HD-DVD and other multichannel players. See Figure 8. However, the multichannel analog audio connection is not

CONNECTIONS

required for DVD-Audio players compliant with HDMI version 1.1 or better, or HD-DVD and Blu-ray Disc players that decode the digital audio internally and output linear PCM signals in digital format. Consult the owner's guide for your disc player for more information.
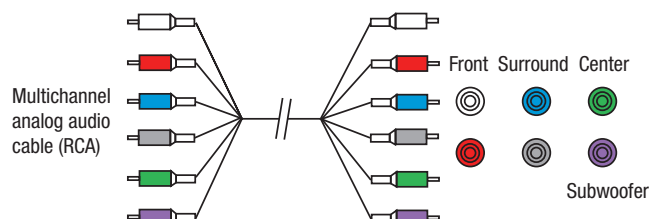
Figure 8 – Multichannel Analog Audio

Harman Kardon receivers also include a proprietary, dedicated audio connection called The Bridge II. If you own an iPod with a dock connector or an iPhone, connect The Bridge II (included) to The Bridge II port on the receiver. See Figure 9. Dock your iPod or iPhone (not included) in The Bridge II, and you may listen to your audio materials through your high-performance audio system. You may view still images or video materials stored on a photo- or video-capable iPod or the iPhone. You may even use the AVR 354 remote to control the iPod or iPhone, with navigation messages displayed on the front panel and on a video display connected to the AVR. The Bridge II outputs analog audio to the AVR 354, and it is available to the multiroom system.

Figure 9 – The Bridge II

Video Connections

Although some sources only produce an audio signal (e.g., CD player, tape deck), many sources output both audio and video signals (e.g., DVD player, cable television box, HDTV tuner, satellite box, VCR, DVR). In addition to the audio connection, make one type of video connection for each of these sources (only one at a time for any source).

Digital Video

If you have already connected a source device to one of the HDMI inputs as explained in the Digital Audio Connections section, you have automatically made a video connection at the same time, as the HDMI signal includes both digital audio and video components.

If the source device is not capable of transmitting its digital audio signal through the HDMI connection, use one of the coaxial or optical digital audio inputs for the source.

If a multichannel analog audio connection is required for certain lossless formats (e.g., DVD-Audio, SACD, Blu-ray Disc or HD-DVD), you may make both audio connections. To listen to the multichannel disc, set the Audio Auto Polling setting to the 6/8CH inputs, and the AVR will automatically select it when no digital signal is output by the player.

Analog Video

There are three types of analog video connections: composite video, S-video and component video.

Composite video is the basic connection most commonly available. The jack is usually color-coded yellow, and looks like an analog audio jack, although it is important never to confuse the two. Do not plug a composite video cable into an analog or coaxial digital audio jack, or vice versa. Both the chrominance (color) and luminance (intensity) components of the video signal are transmitted using a single cable. See Figure 10.

Figure 10 – Composite Video

S-video, or "separate" video, transmits the chrominance and luminance components using separate wires contained within a single cable. The plug on an S-video cable contains four metal pins, plus a plastic guide pin. Be careful to line up the plug correctly when you insert it into the jack on the receiver, source or video display. See Figure 11.

Figure 11 – S-Video

Component video separates the video signal into three components – one luminance ("Y") and two sub-sampled color signals ("Pb" and "Pr") – that are transmitted using three separate cables. The "Y" cable is color-coded green, the "Pb" cable is colored blue and the "Pr" cable is colored red. See Figure 12.
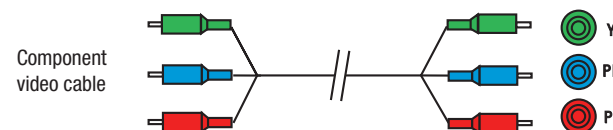
Figure 12 – Component Video

If it's available on your video display, an HDMI connection is recommended as the best quality connection, followed by component video, S-video and then composite video.

NOTES:
- Copy-protected sources are not available at the Component Video Monitor Outputs.
- Standard and high-definition analog video signals are upscaled to 1080i resolution for the Component Video Monitor Outputs. For improved video performance, consider upgrading to an HDMI-capable video display with 1080p resolution.

Antennas

The AVR 354 uses separate terminals for the included FM and AM antennas that provide proper reception for the tuner.

CONNECTIONS

The FM antenna uses a 75-ohm F-connector. See Figure 13.
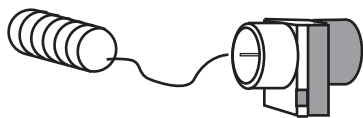
Figure 13 – FM Antenna

The AM loop antenna needs to be assembled. Connect the two leads to the spring terminals on the receiver. As AM antenna leads have no polarity, it doesn't matter which of the two terminals is used for either lead. See Figure 14.
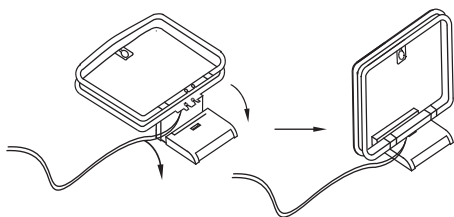
Figure 14 – AM Antenna

To enjoy XM satellite radio, purchase an XM antenna module designed for use with XM Ready devices and a subscription to the XM service. We recommend the XM Mini Tuner and Home Dock Bundle, available at www.xmradio.com. The older Connect and Play module is also compatible with the AVR 354, but it may no longer be available in your area.

An XM Ready-compatible module uses the special connector on the AVR 354's rear panel that allows you to use the AVR's tuner, including its 40 preset station locations and remote control. Although you may use a module with standard audio connections, which may be indicated for "car and home use," you will not be able to enjoy the AVR 354's ease of control.

RS-232 Serial Port

The RS-232 serial port on the AVR 354 is used only for software upgrades. If we release an upgrade for the receiver's operating system at some time in the future, it may be downloaded to the AVR using this port. Complete instructions will be provided at that time.

You are now ready to connect the various components to the receiver. Before beginning, turn off all components, including the AVR 354, and unplug their power cords. **Don't plug in any of the power cords until you have finished making all of your connections.**

Remember that the receiver generates heat while it is on. Select a location that leaves several inches of space on all sides of the receiver. Avoid completely enclosing the receiver inside an unventilated cabinet. It is preferable to place components on separate shelves rather than stacking them directly on top of the receiver. Some surface finishes are delicate. Try to select a location with a sturdy surface finish.

Step One – Connect the Speakers

If you have not yet done so, place your speakers in the listening room, as described in the Speaker Placement section above.

Connect the center, front left, front right, surround left, surround right, surround back left and surround back right loudspeakers to the corresponding speaker terminals on the AVR 354. See Figure 17. Maintain the proper polarity by always connecting the positive and negative terminals on each speaker to the positive and negative terminals on the receiver. Use the Connection Color Guide on page 19 as a reference.
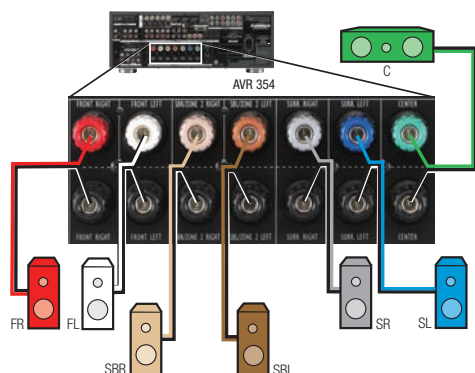
Figure 17 – Speaker Connections

> **NOTE:** If you only have one surround back speaker, wait until after you have run the EzSet/EQ process in the Initial Setup section before connecting it to the Surround Back Left speaker outputs.

Step Two – Connect the Subwoofer

Connect the Subwoofer Output on the AVR 354 to the line-level input on your subwoofer. See Figure 18. Consult the manufacturer's guide for the subwoofer for additional information.

When the system has two subwoofers for a 7.2-channel system, use a Y-Adapter (not included) with one male RCA plug and two female RCA jacks. Connect the male plug to the Subwoofer Output, and connect each female jack to a cable that is then plugged into the line-level input on each subwoofer.
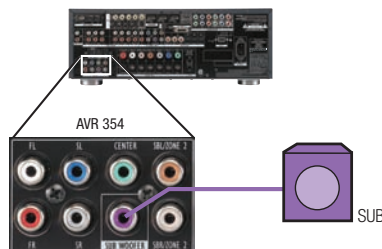
Figure 18 – Subwoofer Connection

Step Three – Connect the Antennas

Connect the FM and AM antennas to their terminals. If you have purchased an XM antenna module designed for connection to an XM Ready device, connect it now. To enjoy XM Radio, remember to purchase a subscription and activate your antenna module. More information is available at www.xmradio.com. See Figure 19.
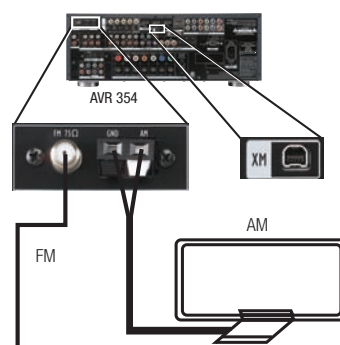
Figure 19 – Antenna Connections

Step Four – Connect the Source Components

A source is a device where the audio and video signals originate. Some sources, such as CD players, only offer audio, while sources used for watching movies or broadcast-television programming deliver a video signal as well.

Referring to the photograph of the AVR 354 remote control on page 15, there is a section of 8 buttons near the top of the remote designated "Source Selectors": Cable/Sat, DVD, Media Server, Radio, TV, Game, The Bridge and AUX. Each of these buttons corresponds to a "source input". The AVR 354's flexible design allows you to use almost any combination of audio and video connections for each source device. The goal of Step Four of the Installation is to match up each of your source devices, e.g., DVD player and cable television box, with the correct connectors on the AVR 354.

> **NOTE:** This is not true of The Bridge II and the tuner, which use dedicated audio source signals, and a dedicated video signal when applicable for The Bridge II.

You may connect a source device to any appropriate input connectors. Note which audio and video inputs are used for each device in Table A5 in the appendix. Table A2 indicates the default input-connection assignments, any of which may be changed to match the actual connections in your system.

INSTALLATION

The precise connections to be made depend on the capabilities of the source device and your video display (TV). Select the best audio and video connections for each source. The types of connections are listed in order of preference:

HDMI Connections

• Choose the HDMI connection if it's available on your source device and your TV. An HDMI connection carries both digital audio and video, enabling a single-cable connection from the source device to the AVR. Except as noted below, no other audio or video connections are required.

> NOTE: If your DVD-Audio, SACD, Blu-ray Disc or HD-DVD player is not capable of outputting multichannel digital audio through its HDMI output, make additional 6-/8-channel analog audio connections.

Audio Connections (for non-HDMI sources)

• Choose one digital audio connection: Optical or Coaxial

• Optional, or where digital audio is not available: Analog audio for making recordings for personal use or as a backup. Analog audio is required for older analog sources that don't have digital audio outputs, such as cassette decks.

Video Connections (for non-HDMI sources)
(choose only one, and make sure that type is available on your TV)

• Component video   • S-video   • Composite video

> NOTES:
> • If the video display is equipped with a DVI digital video input, make sure it is also HDCP-compliant (High-Bandwidth Digital Content Protection) to display copy-protected materials.
>
> • If the source or video display has a DVI input, use an HDMI-to-DVI adapter (not included), and make separate audio connections.

Connect a DVD, SACD, Blu-ray Disc or HD-DVD Player

HDMI Video: If the DVD player and the TV both have an HDMI connector, connect the player as follows (see Figure 20):

• Connect the DVD player's HDMI output to the HDMI 1, 2 or 3 Input on the AVR.

Figure 20 – Connecting An HDMI-Equipped Disc Player

If the player is capable of playing multichannel discs, including DVD-Audio, SACD, Blu-ray Disc and HD-DVD, but it is not capable of outputting the multichannel audio through its HDMI output, make the following additional connections (see Figure 21):

• Connect the DVD player's 6-/8-channel analog audio outputs to the 6-/8-Channel Analog Audio Inputs on the AVR.

Figure 21 – Connecting a Multichannel Audio Player

Component Video: If the DVD player or the TV does not have an HDMI connector, but they both have component video connectors, connect the player as follows (see Figure 22):

• Connect the DVD player's component video output to the Component Video 1, 2 or 3 Input on the AVR.

• Connect one of the DVD player's digital audio outputs to one of the Coaxial or Optical inputs on the AVR.

Figure 22 – Connecting a Component-Video-Equipped Disc Player

If the player is capable of playing multichannel discs, including DVD-Audio, SACD, Blu-ray Disc and HD-DVD, make the following additional connection (see Figure 21):

• Connect the DVD player's 6-/8-channel analog audio outputs to the 6-/8-Channel Analog Audio Inputs on the AVR.

Composite/S-Video: If the best video connection common to both the DVD player and the TV is either S-video or composite video, follow these steps (see Figure 23):

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INSTALLATION

• Connect the DVD player's S-video or composite video output (use one connection only) to the Video 1, 2 or 3 Input on the AVR. You may also use the Video 4 Composite or S-video Input located on the AVR's front panel (see Figure 31).

• Connect the DVD player's digital audio output to one of the Coaxial or Optical inputs on the AVR.

If the player is capable of playing multichannel discs, including DVD-Audio, SACD, Blu-ray Disc and HD-DVD, make the following additional connection (see Figure 23):

• Connect the DVD player's 6-/8-channel analog audio outputs to the 6-/8-Channel Analog Audio Inputs on the AVR.
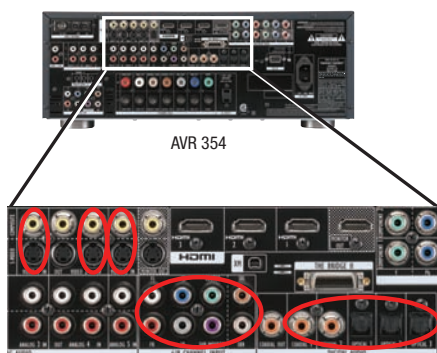
Figure 23 – Connecting a Composite- or S-Video-Equipped Disc Player

NOTES:
• Refer to Table A2 in the appendix for the default audio and video input assignments for each source. Using the default connections, if appropriate for your system, may save a few steps during Initial Setup. However, thanks to the AVR 354's flexibility, you may assign any audio and any video input to any source, as long as the assignments match the physical connections.

• If you wish to make recordings from a DVD, use an S-video or composite video input, and an Analog Audio input in addition to any other connections. The AVR cannot make recordings from HDMI or component video sources, and digital audio sources may only be recorded in two channels.

Connect an Audio/Video Recorder (PVD, DVR or TiVo)

HDMI Video: If the recorder and the TV both have an HDMI connector, connect the recorder as follows (see Figure 24):

• Connect the recorder's HDMI output to the HDMI 1, 2 or 3 Input on the AVR. This connection is for playback only, as the AVR cannot make recordings from HDMI sources.

• To make recordings, follow the instructions below for Composite/ S-video recorders.
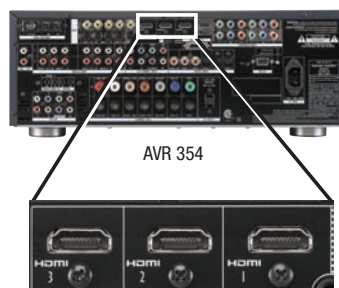
Figure 24 – Connecting an HDMI-Equipped Recorder

Component Video: If the recorder or the TV does not have an HDMI connector, but they both have component video connectors, connect the recorder as follows (see Figure 25):

• Connect the recorder's component video output to the Component Video 1, 2 or 3 Input on the AVR. This connection is for playback only, as the AVR cannot make recordings from component video sources.

• Connect the recorder's digital audio output to a Coaxial or Optical Input on the AVR (if available).

• Follow the instructions in the Composite/S-Video section for making connections required for recordings.
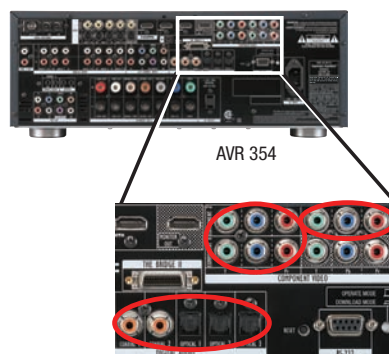
Figure 25 – Connecting a Component-Video-Equipped Recorder

Composite/S-Video: If the best video connection common to both the recorder and the TV is either S-video or composite video, or to make recordings, follow these steps, using only one type of video connection throughout (see Figure 26):

• Connect the recorder's S-video/composite video output to the Video 2 S-Video/Composite Video Input on the AVR.

• Connect the recorder's S-video/composite video input to the Video 2 S-Video/Composite Video Output on the AVR.

• Connect the recorder's analog audio outputs to the Analog 4 Audio Inputs on the AVR.

• Connect the recorder's analog audio inputs to the Analog 4 Audio Outputs on the AVR.

INSTALLATION
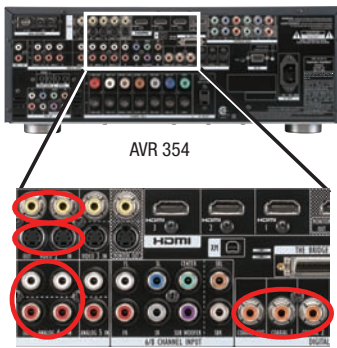
Figure 26 – Connecting a Composite or S-Video Recorder

Figure 27 – Connecting a Composite- or S-Video-Equipped Set-Top Box

• To make two-channel digital audio recordings, connect the recorder's digital audio output to one of the Optical or Coaxial Inputs, and connect the AVR's Coaxial Digital Audio Output to the recorder's coaxial input. The AVR will convert an optical digital audio input signal to the proper format for recording via the Coaxial Digital Audio Output. See Figure 26.

Connect a Cable TV, Satellite, HDTV or Other Set-Top Box for Broadcast Television

> NOTE: If the TV has a digital audio output, connect it to one of the digital audio inputs. If you use a direct cable connection to your TV, or an antenna connection with the TV's internal tuner, connect either the TV's digital audio output (if available) or its analog audio outputs to the AVR. See Step Five for information on connecting the receiver's video monitor outputs to the television.

HDMI Video: If the set-top box and the TV both have an HDMI connector, connect the set-top box as follows (see Figure 24):

• Connect the set-top's HDMI output to the HDMI 1, 2 or 3 Input on the AVR.
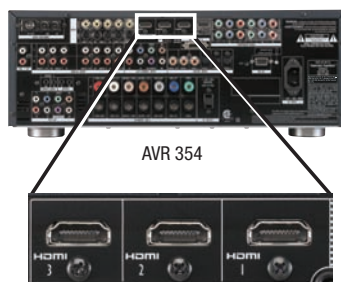
Component Video: If the set-top box or the TV does not have an HDMI connector, but they both have component video connectors, connect the set-top box as follows (see Figure 25):

• Connect the set-top's component video output to the Component Video 1, 2 or 3 Input on the AVR (if available).

• Connect the set-top's digital audio output to one of the Coaxial or Optical Inputs on the AVR (if available).

Composite S/Video: If the best video connection common to both the set-top box and the TV is either S-video or composite video, follow these steps (see Figure 27):

• Connect the set-top's S-video or composite video output (use one connection only) to the corresponding Video 1, 2 or 3 Input on the AVR.

• Connect the set-top's digital audio output to one of the Coaxial or Optical Inputs on the AVR (if available). For fully analog set-top boxes, connect the box's analog audio outputs to the AVR's Analog 1, 2, 3, 4 or 5 Audio Inputs.
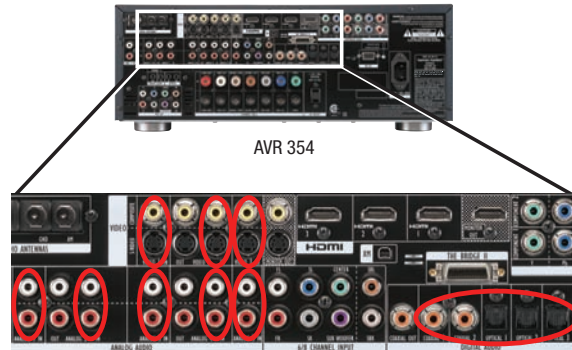
Connect a CD Player or Any Audio-Only Device

If the CD player or other component has a digital audio output, connect it to any available digital audio input on the AVR. If not, connect the CD player's left and right analog audio outputs to the Analog 1 or 2 Audio Inputs. No video connection is required, although the AVR will display any signal at the video input assigned to the same source as the audio inputs. See Figure 28.
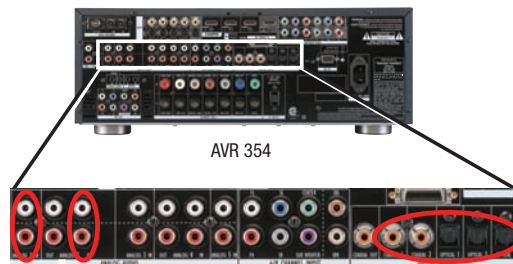
Figure 28 – Connecting a CD or Audio-Only Source

> NOTES:
> • A turntable may only be connected to the AVR if it is equipped with an internal phono preamp, or if you supply an external phono preamp, available at some audio specialty stores or through the Harman Kardon Parts Dept. You may then connect it to any set of analog audio inputs.
>
> • Although there is no official source on the AVR 354 named CD, Phono or Audio, you may assign the audio device to an available source, such as TV (if the Cable/Sat source is in use for broadcast television), Game or AUX. See the Initial Setup section for more details on source assignment.

Connect a Tape Deck or Any Audio-Only Recorder

If the recorder has digital audio inputs and outputs, connect either its coaxial or optical digital audio output (not both) to the corresponding available input on the AVR, and connect the AVR's Coaxial Digital Audio Output to the recorder's coaxial digital audio input.

INSTALLATION

To make analog audio recordings, connect the recorder's left and right analog audio outputs to the Analog 2 Audio Inputs on the AVR, and the recorder's analog audio inputs to the AVR's Analog 2 Audio Outputs.

No video connection is required, although the AVR will display any signal at the video input assigned to the same source as the Analog 2 Audio Inputs. See Figure 29.
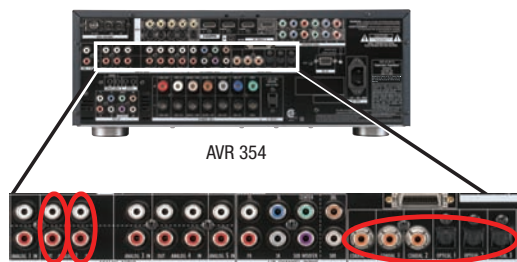
Figure 29 – Connecting an Audio Recorder

Connect an iPod, iPod touch or iPhone Using ᵀʰᵉBridge ᴵᴵ Docking Station

The AVR 354 includes The Bridge II, a docking station for an iPod, iPod touch or iPhone (not included) that allows you to enjoy audio and video content stored on the device with all the power and fidelity of your home theater system. With The Bridge II, navigation and control of the iPod or iPhone is a simple matter of using the preprogrammed AVR remote and following the on-screen menus. The system even charges the iPod or iPhone when the AVR is powered on.

Simply plug the proprietary cable from The Bridge II into the special The Bridge II connector on the rear of the AVR 354. See Figure 30. Use the dock adapter supplied with the iPod or iPhone, or obtain an adapter to avoid damaging The Bridge II, Apple® iPod or iPhone during use.
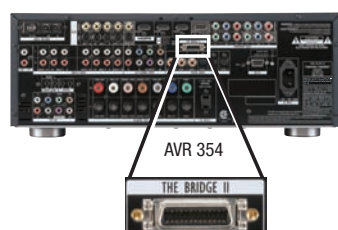
Figure 30 – The Bridge II Connector

> NOTE: The original version of this accessory, known as The Bridge, is not compatible with the AVR 354. Should you misplace The Bridge II that is included with the AVR 354 in the future, contact Harman Kardon and make sure to order The Bridge II as a replacement.

Alternatively, or if you have another brand of portable audio player, use an interconnect with a stereo 1/8-inch mini-plug at one end and two RCA plugs at the other end to connect the player to the Audio Inputs on the AVR's front panel. See Figure 31.

Connecting a Game Console, Camera or Other Device

If a device will only be connected temporarily, you may use the audio/video inputs on the front panel. When not in use, place the supplied covers over the jacks for a cleaner appearance by snapping the covers in place. To remove the covers, gently press on the left side of each cover so that it pivots out.

Video Components: Install video components, e.g., game consoles and camcorders, as follows (see Figure 31):

• Connect the component's S-video or composite video output (use only one connection) to the corresponding front-panel Input on the AVR.

• Connect the component's optical or coaxial digital audio output to either the Optical or Coaxial Input on the front panel (if available). For fully analog devices, connect the device's analog audio outputs to the AVR's front-panel Analog Audio Inputs.
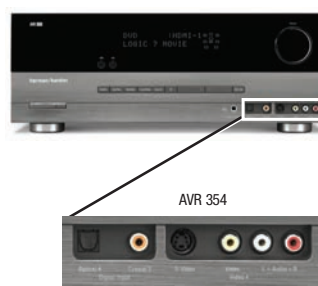
Figure 31 – Connecting a Device to the Front-Panel Inputs

Audio Components: Connect audio-only devices, such as CD players, to either the Coaxial or Optical Digital Audio Inputs, or the Analog Audio Inputs (see Figure 31).

> NOTE: If your video devices are equipped with HDMI or component video outputs, you may connect them to any available audio and video input on the AVR.

Step Five – Connect the Video Display

> IMPORTANT NOTE: Do not connect any video output on the video display (TV) to any video input on the AVR. Doing so will cause undesirable video interference.

HDMI Video: If the display has an HDMI input, connect the HDMI Monitor Output to the display (see Figure 32). Thanks to the AVR 354's sophisticated video processing and upscaling capabilities, no other video connections are required from the AVR to the video display. Analog video sources (composite, S-video and component) are converted to the HDMI format and upscaled to as much as 1080p resolution, depending on the display's capabilities. Proceed to Step Six.

INSTALLATION
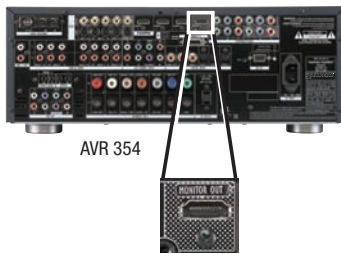
Figure 32 – HDMI Monitor Output

Component Video: If the display does not have HDMI inputs, but does have component video inputs, connect the Component Video Monitor Outputs to the display (see Figure 33). As with HDMI connections, the AVR 354 is capable of converting composite and S-video sources to the component video format, while upscaling the resolution to as high as 1080i, depending on the display's capabilities. Unlike HDMI connections, component video connections do not enable the AVR 354 to detect the display's capabilities and the appropriate resolution must be selected manually, as described in the Initial Setup section.

Figure 33 – Component Video Monitor Outputs

Composite/S-Video: If the video display does not have HDMI or component video inputs, connect the corresponding composite or S-video Monitor Output to the display. If available, S-video is preferred over composite video, and if used, the AVR 354 will convert composite video sources to S-video. See Figure 34.
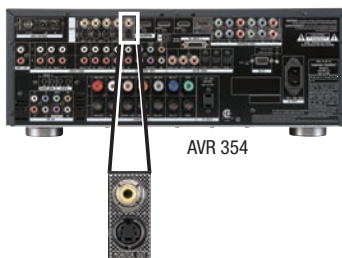
Figure 34 – Composite and S-Video Monitor Outputs

Consult the manual for your TV to make sure you understand how to select the correct video input.

Step Six – Plug in AC Power

Having made all of your wiring connections, it is now time to plug each component's AC power cord into a working outlet.

You may plug one device into the AC Switched Accessory Outlet on the rear of the AVR 354. See Figure 35. Make sure this device draws no more than 50 watts. The device should have its mechanical or master power switch turned on, and it will power on any time the AVR 354 is turned on. If the device has a clock or must always be on, do not plug it into this outlet.

Figure 35 – Switched AC Accessory Outlet

Before plugging the AVR 354's AC Power Cord into an electrical outlet, make sure that the Master Power Switch on the front panel is popped out so that the word OFF appears on its top. Gently press the button to turn the switch off. This will prevent the possibility of damaging the AVR in case of a transient power surge.

The AVR 354 is equipped with a detachable power cord. It allows you to fully wire your system before installing the AVR, which may be required for some in-wall entertainment centers or custom applications. The male end of the cord should be plugged into an unswitched AC power outlet, and the female end should be plugged into the receptacle on the AVR 354's rear panel. See Figure 36.

Figure 36 – AC Power Input

Step Seven – Insert Batteries in Remote

The AVR 354 remote control uses four AAA batteries, which are included.

To remove the battery cover located on the back of the remote, squeeze the tab and lift the cover.

Insert the batteries, as shown in Figure 37, making sure to observe the correct polarity.

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Figure 37 – Remote Battery Compartment

When using the remote, remember to point the lens toward the front panel of the AVR 354. Make sure no objects, such as furniture, are blocking the remote's path to the receiver. Bright lights, fluorescent lights and plasma video displays may interfere with the remote's functioning. The remote has a range of about 20 feet, depending on the lighting conditions. It may be used at an angle of up to 30 degrees to either side of the AVR.

If the remote lights up when a button is pressed but the AVR does not respond, check that the Zone Selector Switch at the bottom is in the Zone 1 position.

If the remote seems to operate intermittently, or if pressing a button on the remote does not cause the AVR Settings Button or one of the Source Selectors to light up, then make sure the batteries have been inserted correctly, or replace all three batteries with fresh ones.

Step Eight – Program Sources Into the Remote

The AVR 354 remote not only is capable of controlling the receiver, but it may also be programmed to control many brands and models of DVD players, cable boxes, satellite receivers, the Harman Kardon DMC 1000 digital media center and TVs. It is also preprogrammed to operate your iPod, iPod touch or iPhone when docked in The Bridge II.

It may help to think of the remote as a book with pages. Each "page" represents the button functions for a different device. To access the functions for a particular device, first turn to its page; that is, switch the remote's device mode. Press the AVR Settings Button to access the codes that control the receiver, or the Source Selector Buttons to access the codes for the devices programmed into the remote.

The AVR 354's remote is factory-programmed to control many Harman Kardon DVD players. If you have other source devices in your system, follow these steps to program the correct codes into the remote.

1. Using the codes in Tables A14 – A24 of the Appendix, look up the product type (e.g., DVD, cable TV box) and the brand name of your source. The number(s) listed is/are potential candidates for the correct code set for your particular device.

> NOTE: The AUX Source Selector is used for the CD, HDTV, PVD recorder, TiVo and VCR device types. Select the brand code from the appendix table corresponding to the device and program it into the AUX Source Selector. Similarly, the CBL/SAT Source Selector is used for either a cable or satellite television set-top box. The first digit of the product code indicates the device type.

2. Turn on your source device.

3. This step places the remote in program mode. Referring to Figure 38, press and hold the Source Selector. The button will turn red, then go dark. Continue holding it, and when it turns red again, release the button; the remote is now in program mode. Follow the directions in Step 4, below.
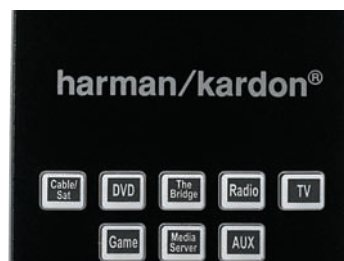
Figure 38 – Source Selectors

Optional: To reassign a device type from one Source Selector to another Source Selector not being used, e.g. if there are two DVD players in the system, press the Source Selector for the new device type now. For example, to reassign the Cable/Sat Source Selector to operate a DVD player, first press and hold the Cable/Sat Button, and then press the DVD Button.

4. Enter a code from Step 1, above.

   a) If the device turns off, press the Source Selector again to accept the code; it will flash. The remote will exit Program mode.

   b) If the device does not turn off, try entering another code. If you run out of codes, you may search through all of the codes in the remote's library for that product type by pressing the ▲ or ▼ Button repeatedly until the device turns off. When the device turns off, enter the code by pressing the Source Selector, which will flash. The remote then exits Program mode.

5. Once you have programmed a code, it's a good idea to try using some other functions to control the device. Sometimes, manufacturers use the same Power code for several different models, while other codes will vary. You may wish to repeat this process until you've programmed a satisfactory code set that operates most of the functions you frequently use.

6. Find out which code number you have programmed by pressing and holding the Source Selector to enter the Program mode. Then press the OK Button, and the Source Selector will flash in the code sequence. One flash represents "1", two flashes for "2", and so forth. A series of many fast flashes represents "0". Record the codes programmed for each device in Table A9 in the appendix.

After you have programmed a code set to operate a device, test the functions to see which ones may be missing or not operating correctly. You may "learn" individual key codes if you have the device's original remote control by following this procedure:

INSTALLATION

a) Place the two remotes so that their IR transmitters face each other end to end, separated by about one inch. See Figure 39. The AVR 354 remote's transmitter also serves as an IR receiver during the learning process.

Figure 39 – AVR 354 and Original Remote Head-to-Head

b) Press the Source Selector for the device mode you wish to learn a code into, and place the AVR 354 remote in Learning mode by pressing and holding the Learn Button until the Source Selector lights up, then release. See Figure 40.

Figure 40 – Learning Remote Commands

c) Press the button on the AVR 350 remote you wish to program with the new code, and the Source Selector will flash once. You may learn a new code into the following buttons: Device Power On/Off, Alphanumeric Keys, Last Button, Back/Exit Button, Menu Button, ▲/▼/◀/▶ Navigation Buttons, OK Button, Disc Menu Button, the four Teletext Buttons, Channel Up/Down, Volume Up/Down, Mute and the Transport Controls (including Record).

d) Press and hold the button on the device's original remote whose code you wish to "learn" until the Source Selector flashes three times, then release.

e) You may program additional buttons by repeating steps c) and d). Press the Learn Button once to exit Learning mode, or wait for the remote to "time out" and exit Learning mode on its own after about 30 seconds.

If you are unable to locate a code set that correctly operates your source device, it will not be possible to use the AVR remote to control that device. However, you may still connect the source to the AVR 354 and operate it using the device's original remote control.

Most of the button labels on the remote describe the button's function when used to control the AVR 354. However, the button may perform a very different function when used to control another device. Refer to the Remote Control Function List, Table A13 in the Appendix, for a list of each button's functions with the various product types.

If you wish, you may program Activities, which are preprogrammed code sequences that execute many code commands with a single button press. You may also program "punch-through" codes, which allow the remote to operate the channel or transport controls of another device without having to switch the remote's device mode. See page 56 for instructions on these advanced programming functions.

Step Nine – Remote IR Inputs and Output (Optional)

The AVR 354 is equipped with a Remote IR Input, a Zone 2 Input and both full-carrier and stripped Remote IR Outputs to facilitate use of your system with a remote control in a variety of situations. See Figure 41.
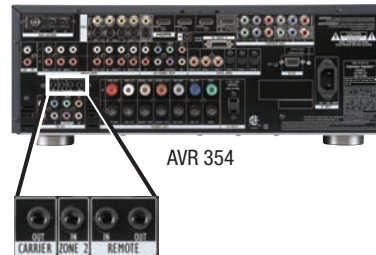
Figure 41 – IR Inputs and Outputs

When the AVR 354 is placed in such a way that aiming the remote at the front-panel IR sensor is difficult, such as inside a cabinet or facing away from the listener, you may connect an external IR receiver, such as the optional Harman Kardon HE 1000, to the Remote IR Input jack. When you are using the AVR 354 in multizone mode, you may connect an optional IR receiver, keypad or other control device to the Zone 2 IR Input for remote control of the AVR 354 (and any sources connected to the AVR's Remote IR Output) from the remote zone. Any signals transmitted through the Zone 2 IR Input will only control source selection and volume for the remote zone. If a source device is being shared with the main listening area, then any control commands issued to that source will also affect the main room.

If any of your source devices are equipped with a compatible Remote IR Input, use a 1/8" mini-plug interconnect cable (not included) to connect the AVR's Remote IR Output to the source device's Remote IR Input, which will pass any applicable remote signals transmitted through the AVR to the source device. This enables you to control your sources even when the AVR itself is controlled via an external IR receiver.

Check with the manufacturer of the source device for more information on the type of IR signal expected. The AVR 354 will output a "stripped carrier" IR signal through the Remote IR Output, but a full-carrier IR signal is available at the Carrier Remote IR Output.

To control more than one source device using the Remote IR Output, connect all sources in "daisy chain" fashion, with the AVR's Remote IR Output connected to the first device's Remote IR Input, the second device's Remote IR Output connected to the next device's Remote IR Input, and so forth. Connect devices expecting a full-carrier IR signal to the Carrier Remote IR Output. Use the Remote IR Output for devices expecting a stripped signal.

Step Ten – Install a Multizone System (Optional)

The AVR 354 offers several methods of distributing music to other listening areas in your home. A multizone system is not required to enjoy the home theater experience. If you prefer not to install a multizone system at this time, skip to Step Eleven to turn on the AVR 354 and configure it.

INSTALLATION

IMPORTANT SAFETY NOTE: Installing a multizone system typi-
cally requires running various cables inside walls. Always comply
with the appropriate safety codes when installing concealed wiring.
The AVR 354's multizone connections should be installed per the
requirements of all applicable state and local building codes, as
well as NEC (National Electrical Code) requirements. Failure to do
so may present a potential safety hazard. If you have any doubt
about your ability to work with electrical and telecommunications
wiring, you are advised to hire a licensed electrician or custom
installer to install the multizone system.

Multizone operation uses the Surround Back/Zone 2 amplifier channels,
whether you connect the remote speakers directly to the speaker outputs,
or if you connect an optional external amplifier to the preamp outputs. This
limits the system in the main listening room to 5.1 channels, which means
you cannot listen to 6.1- or 7.1-channel programs in the main room.

Select one or all three of these systems:

1. Connect an external amplifier to the Zone 2 Audio Outputs.
   See Figure 42.

Figure 42 – Zone 2 Audio Outputs

It is recommended that you place the amplifier in the same room
as the AVR 354 so that a shorter length of interconnect cable is
used with a long run of speaker wire to the remote room, rather than
placing the amplifier in the remote room, which necessitates a long
run of interconnect cable that would be subject to signal degradation.
Depending on the number of channels available in your amplifier,
you may distribute the AVR 354's analog audio signal to a single pair
of speakers for 2-channel listening, or to several pairs of speakers
located in different rooms.

The advantage of using the Zone 2 Audio Outputs is the ability
to have a 7.1-channel system in the main listening area at the same
time others are listening to a different source in the remote zone.
However, the benefit is achieved at the expense of purchasing an
additional component, i.e., the amplifier.

2. Connect the remote room's speakers directly to the Surround
   Back/Zone 2 Speaker Outputs. See Figure 43.

AVR 354

Figure 43 – Surround Back/Zone 2 Speaker Outputs

If you prefer not to purchase an external amplifier, you may reassign
the AVR 354's Surround Back amplifier channels to power the
speakers. However, your main system will be limited to 5.1 channels,
which affects playback of discs and other programs recorded in 6.1
or 7.1 channels.

3. Connect an external amplifier to the Surround Back/Zone 2 Preamp
   Outputs. See Figure 44.

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Figure 44 – Surround Back/Zone 2 Preamp Outputs

This method also requires you to provide an additional amplifier. However,
this method may be used to increase the number of remote rooms in
the system when you are also using the Surround Back/Zone 2 Speaker
Outputs and the Zone 2 Audio Outputs.

In addition to the audio signal, you may connect an IR control device to
the AVR 354's Zone IR Input so that listeners in the remote room may
turn the multizone system on or off, select a source input, control the
source device connected to that input and adjust the volume in the
remote zone.

NOTE: Only analog audio sources are available to the multizone
system.

Step Eleven – Turn On the AVR 354

Two steps are required the first time you turn on the AVR 354.

1. Gently press the Master Power Switch until the word OFF is no longer
   visible. The Power Indicator above the two power switches should
   light up in amber, indicating that the AVR is in Standby mode and is
   ready to be turned on. See Figure 45. Normally, you may leave the
   Master Power Switch in the ON position, even when the receiver is
   not being used.

harman/kardon

Figure 45 – Power Switches

2. There are several ways in which the AVR 354 may be turned on
   from Standby mode.

   a) Press the Standby/On Switch on the front panel. See Figure 45.

INSTALLATION

b) Using the remote, press the AVR Power On Button or any of the
Source Selectors. See Figure 46.

Figure 46 – AVR Power On and Source Selectors

NOTES:
• Any time you press one of the Source Selectors on the
remote (i.e., Cable/Sat, DVD, Media Server, Radio, TV, Game
or AUX), the remote will switch modes to transmit the codes
programmed to operate that device. To control the receiver,
press the AVR Settings Button to return the remote to AVR
mode. Some AVR functions are available in all device modes,
and you don't have to press the AVR Settings Button first to
use them: Volume Controls (including Mute), Audio Effects,
Video Modes, Surround Modes, AVR Settings, Info Settings,
Sleep Settings and AVR Power On and Off.

• If you are not using the AVR's HDMI Output with your display,
you may not see a picture the first time you turn on the AVR 354,
or after a system reset. To correct this, press the front-panel
Resolution Button to display the current video output resolution.
Use the ▲ Button to change it to 480i, which should be
compatible with all video displays, then press the OK Button
to select the new setting. You will be prompted to accept or
cancel the change; the CANCEL message will appear on the
front panel. Press the ▼ Button to view the ACCEPT option,
and then press the OK Button to complete the change to the
output resolution. Follow the directions in the Initial Setup
section to configure the AVR to function correctly with your
display and other components.

OPERATION

Now that you have installed your system components and completed a basic configuration of your receiver, you are ready to begin enjoying your home theater system.

Turning On the AVR 354

Gently press the Master Power Switch until the word OFF is no longer visible. The Power Indicator above the two power switches should light up in amber. This indicates that the AVR is in Standby mode and is ready to be turned on. Normally, you may leave the Master Power Switch in the ON position, even when the receiver is not being used. See Figure 45.

There are several ways in which the AVR 354 may be turned on:

a) Press the Standby/On Switch on the front panel. See Figure 45.

b) Using the remote, press the AVR Power On Button or any of the Source Selectors. See Figure 46.

To turn the receiver off, press either the Standby/On Switch on the front panel, or press the AVR Power Off Button on the remote. Unless the receiver will not be used for an extended period of time (for example, when are on vacation), it is not necessary to turn off the Master Power Switch. When the Master Power Switch is turned off, any settings you have programmed, including system configuration and preset radio stations, will be preserved for up to four weeks.

> **IMPORTANT NOTE:** If the PROTECT message ever appears in the Message Display, turn off the AVR and unplug it. Check all speaker wires for a possible short. If none is found, bring the unit to an authorized Harman Kardon service center for inspection and repair before using it again.

Volume Control

The volume may be adjusted either by turning the knob on the front panel (clockwise to increase volume or counterclockwise to decrease volume), or by pressing the Volume Control on the remote. See Figure 56. The volume is displayed as a negative number of decibels (dB) below the 0dB reference point.

Unlike the volume controls on some other products, 0dB is the maximum volume for the AVR 354. Although it's physically possible to turn the volume to a higher level, doing so may damage your hearing and your speakers. For certain more dynamic audio materials, even 0dB may be too high, allowing for damage to equipment. We urge caution with regard to volume levels.

You may change the volume level display from the default decibel scale to a 0-to-100 scale by adjusting the Volume Units setting in the System Settings menu, as described on page 55.

Figure 56 – Volume Controls

Mute Function

To temporarily mute all speakers and the headphones, press the Mute Button on the remote. See Figure 56. Any recording in progress will not be affected. The MUTE message will appear in the display as a reminder. To restore normal audio, either press the Mute Button again, or adjust the volume. Turning off the AVR will also end muting.

Sleep Timer

You may program the AVR to play for up to 90 minutes and then turn off automatically using the sleep timer.

Press the Sleep Settings Button on the remote, and the time until turn-off will be displayed. See Figure 57. Each additional press of the Sleep Button will increase the time until turn-off by 10 minutes, up to a maximum of 90 minutes, then the SLEEP OFF setting appears, which disables the sleep timer.
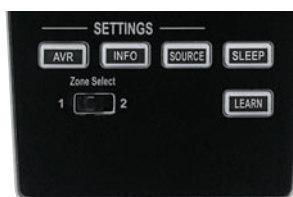
Figure 57 – Sleep Settings Button

When the sleep timer has been set, the front-panel display will automatically dim to half-brightness. If you press any button on the remote or front panel, the display will return to full-brightness. The display will dim again several seconds after your last command.

If you press the Sleep Button after the timer has been set, the remaining time until turn-off will be displayed. You may press the Sleep Button to change the time until turn-off.

Audio Effects

Depending on your preferences or the specific characteristics of your listening room, you may wish to adjust some of the audio settings, such as tone controls, to improve performance. Access these settings from the Audio Effects submenu, as described in the Advanced Functions section.

It is not necessary to adjust the Audio Effects settings to enjoy your new AVR. We recommend leaving the settings at their default values until you are more familiar with your system.

Video Modes

The settings in the Video Modes menu are used to fine-tune the picture if necessary after making all adjustments on the video display. It is recommended that you leave the settings at their defaults. See the Advanced Functions section for detailed information.

Headphones

Plug the 1/4" plug on a pair of headphones into the headphone jack on the front of the receiver for private listening. See Figure 58.

OPERATION

The DOLBY H:BYPASS message indicates that Dolby Headphone surround processing is in the default bypass mode, which delivers a conventional 2-channel signal to the headphones.

Figure 58 – Headphone Jack

Press the Surround Modes Button on the front panel or the remote, to switch to Dolby Headphone virtual surround processing, indicated by the DOLBY H:DH message. Dolby Headphone delivers an enhanced sound field that emulates a 5.1-channel speaker system. No other surround modes are available for the headphones.

Source Selection

Press the front-panel Source List Button to scroll through the sources. Each press of the button scrolls down the list that appears in the display and on screen. See Figure 59.
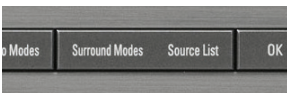
Figure 59 – Source List Button

For direct access to any source, press its Source Selector on the remote.

The AVR 354 will switch to the audio and video inputs assigned to the source.

The source name will appear in the upper line of the front-panel display. If you retitled the source, the new title will appear. The audio and video inputs assigned to the source will also appear briefly. The surround mode will be displayed on the lower line.

Any other settings you adjusted in the Setup Source menu will also be selected. You may view these settings in the Source Info menu at any time by pressing the Info Settings Button.

VIDEO TROUBLESHOOTING TIPS:
If a video source is playing and there is no picture:

• Check that you have selected the source to which the video input was assigned.

• Check the wires for a loose or incorrect connection.

• Check that you have selected the correct video input on the display device (TV).

• Try pressing the Resolution Button on the front panel repeatedly until the correct video output resolution is selected and a picture appears. You will be prompted to accept or cancel the resolution change, as the CANCEL message will appear on the front panel. Press the ▼ Button to view the ACCEPT option, and then press the OK Button to complete the change to the output resolution.

Additional tips for systems using HDMI:
• Turn off all devices (including the TV, AVR and any source components).

• Unplug the HDMI cables starting with the cable between the TV and AVR, and continuing with the cables between the AVR and each source device.

• Carefully reconnect the cables from the source devices to the AVR, and connect the cable from the AVR to the TV last.

• Turn on the devices in this order: TV, then AVR, then source devices.

Using the Tuner

To select the AVR 354's built-in tuner:

1. Press the Source List Button on the front panel repeatedly until the desired tuner band is selected, or use the ▲/▼ Buttons to scroll through the source list.

2. Press the Radio Source Selector on the remote. Press this button again to switch bands (AM, FM or XM).

A screen similar to the one shown in Figure 60 will appear, with the band indicated in the middle of the screen. (The XM band uses a slightly different screen.)

Figure 60 – FM Radio

Use the ▲/▼ Buttons to tune a station (or channel for XM Radio). The frequencies will be displayed in the front panel and graphically on screen.

The AVR defaults to automatic tuning, meaning each press of the ▲/▼ Buttons scans through all frequencies until a station with acceptable signal strength is found. To switch to manual tuning, in which each press of the ▲/▼ Buttons steps through a single frequency increment (0.1MHz for FM, or 10kHz for AM), press the Menu Button. The Radio Modes line will be highlighted, and each press of the OK Button toggles between automatic and manual tuning modes.

When an FM station has been tuned, toggling the radio mode switches between stereo and monaural play, which may improve reception of weaker stations.

A total of 30 stations (AM and FM together) may be stored as presets. When the desired station has been tuned, press the OK Button, and two dashes will flash in the front-panel display. Use the Alphanumeric Keys to enter the desired preset number.

OPERATION

To tune a preset station, press the ◄/► Buttons or the Channel Control, or press the Menu Button to view the list of programmed presets and scroll to the desired selection. Press the OK Button to tune the station. You may also enter the preset number using the Numeric Keys. For presets 10 through 30 press 0 before the preset number. For example, to enter preset 21, press 0-2-1.

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 354 is an XM Ready device, which means that it is able to receive the XM service when a user-supplied XM antenna module is connected and the service activated.

Select an antenna module designated for XM Ready audio components. An XM Ready-compatible module uses the special connector on the AVR 354's rear panel that allows you to use the AVR's tuner, including its 40 preset station locations and remote control. Although you may use a module with standard audio connections, which may be indicated for "car and home use," you will not be able to enjoy the AVR 354's ease of control.

The XM Mini-Tuner and Home Dock (Models CNP-2000 and CNP-2000H; both pieces are required) are compatible with the AVR 354. The older Audiovox® CNP 1000 "Connect and Play" module for home audio use is also compatible, but has been discontinued and may no longer be available. Additional modules may become available in the future. Modules produced for automotive, or "mobile," use are not compatible with the AVR 354, although if they have standard analog or digital audio outputs, they may be connected to a compatible input and operated using their own controls.

NOTE: To listen to XM Radio using the AVR 354, you will need to purchase an XM antenna module and subscription, and activate your module. XM service is not available in Alaska or Hawaii. Visit the XM Radio Web site at www.xmradio.com for more information.

Plug the module into the XM Antenna Jack on the rear of the AVR 354. Place the antenna module so that it has a clear view through a south-facing window in order to obtain reception from the XM satellite.

Select XM Radio as the source in one of these ways:

1. Press the Source List Button on the front panel repeatedly until XM Radio is selected, or use the ▲/▼ Buttons to scroll through the source list.

2. Press the Radio Source Selector on the remote repeatedly until XM Radio is selected..

You should be able to tune in Channel 1, the Preview Channel, to confirm that your equipment is ready for activation. There are four ways to tune an XM Radio channel:

1. Press the Menu Button to select a search mode: preset, category, all channels (the default) or direct entry.

2. Use the ▲/▼ Buttons to scan through the channel numbers in the default All Channel search mode. If you press the OK Button first, pressing the ▲/▼ Buttons will scan through any preset positions you have programmed (Preset search mode).

3. In Category search mode, use the ◄/► Buttons to jump to the next category, and then use the ▲/▼ Buttons to scan through the channel numbers within the category.

4. After you have programmed presets, directly enter the preset number (1 through 40) using the Alphanumeric Keys. For single-digit positions, enter a "0" before the number. Select Direct Entry search mode, and use the Alphanumeric Keys to select a channel directly.

When you are able to hear Channel 1, you are ready to activate your module. If you don't hear Channel 1, make sure the module's plug is firmly seated in the XM Antenna jack, and that the module is near a south-facing window. Try unfolding the module and rotating it to obtain reception. You may need to purchase an extension cable, available on the XM Radio site, to ensure that the module is near the window.

Tune to Channel 0 for a display of your antenna module's Radio ID number, required for activation.

The current channel number and preset location will appear in the upper line of the Message Display, and the search mode (all channels, category) will appear in the lower line. Three signal-strength bars will appear to the right of the channel number and preset location to indicate signal strength. The song title, artist and channel category, along with the channel number and preset position (if programmed), will all appear on screen when a video display is in use.

For traffic and weather channels, the current city's name will appear instead of the channel name, and the local weather and temperature will be displayed on screen.

To store a channel in one of the 40 preset locations:

1. Tune to the desired channel and press the OK Button. The lowest available preset number will flash on screen and in the front-panel Message Display.

2. Use the Alphanumeric Keys to enter the numbered preset location you wish to store the channel in, or do nothing if the current preset location is acceptable.

3. Press the OK Button to store the new preset.

Recording

Two-channel analog and digital audio signals, as well as composite and S-video signals, are normally available at the appropriate recording outputs. Thus, to make a recording, you need only make sure to connect your audio or video recorder to the appropriate output jacks, as described in the Installation section, insert blank media and make sure the recorder is turned on and recording while the source is playing.

OPERATION

NOTES:

1. Analog audio signals are not converted to digital form, and digital audio signals are not converted to analog audio form. However, you may record a coaxial or optical digital audio source using either type of digital audio output.

2. Only PCM digital audio signals are available for recording. Proprietary formats such as Dolby Digital and DTS may not be recorded using the digital audio connections, although if the source is connected to the AVR using analog audio connections, an analog recording may be made.

3. HDMI and component video sources are not available for recording.

4. Please make certain that you are aware of any copyright restrictions on any material you record. Unauthorized duplication of copyrighted materials is prohibited by federal law.

Using The Bridge II Docking Station

The Bridge II is an included dock that may be used with a compatible iPod, iPod touch or iPhone (not included). When The Bridge II is connected to its proprietary input on the AVR 354 and the iPod is docked, you may play the audio, video and still-image materials on your iPod through your high-quality audio/video system, operate the iPod using the AVR remote or the AVR's front-panel controls, view navigation messages on the AVR's front panel or a connected video display, and charge the iPod.

Either press the front-panel Source Selector repeatedly until the message "The Bridge is CONNECTED" appears in the front panel, or press The Bridge Source Selector on the remote.

When The Bridge II is connected, the screen shown in Figure 61 will appear on a video display connected to the AVR. In this case, the iPod has not been docked in The Bridge II yet.
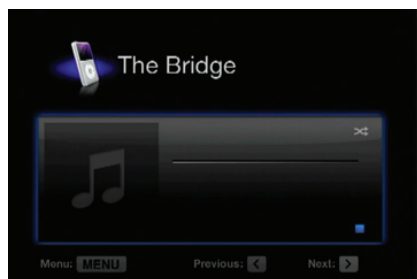
Figure 61 – The Bridge

Press the Menu Button to view the slide-out menu:

Back: Select this option to return to the previous screen.

Music: Select this line to navigate the audio materials stored on your iPod.

Photos: Select this line to view still images stored on the iPod.

Videos: Select this line to play videos stored on the iPod. A screen will appear, instructing you to operate the iPod's own controls directly to play videos. You may use the AVR 354 remote instead of the iPod's controls

to navigate it. Visual materials will be displayed on a video display connected to the AVR.

NOTE: After selecting video viewing, the AVR may remain in iPod Manual Mode, even after undocking the iPod or switching to another source input and back again. To return to normal operation, with the AVR remote in The Bridge mode, press and hold the Menu Button.

Random: Select this setting for random playback, also known as "Shuffle Mode". Each press of the OK Button switches the setting: shuffle by Song, shuffle by Album, or Off to end random playback.

Repeat: Select this setting to repeat a track or all tracks in the current album or play list. Each press of the OK Button switches the setting: repeat Off, repeat One or repeat All.

NOTE: The iTunes® application allows you to set certain selections to always be skipped in Shuffle mode. The AVR 354's settings cannot override these iTunes settings.

Table 2 summarizes the controls available when The Bridge II is in use.

Table 2 – Using The Bridge II

iPod Function	Remote Control Key	Front-Panel Button
Play	Play (▶)	
Pause	Pause (‖)	
Menu	Menu	
Select	OK	OK
Scroll Reverse	Left Arrow (◀)	
Scroll Forward	Right Arrow (▶)	
Forward Search/Next Track	Forward/Next (▶▶)	Right (▶)
Reverse Search/Previous Track	Reverse/Previous (◀◀)	Left (◀)
Alphabetical Search	Alphanumeric Key	
Stop	Stop (■)	
Page Up/Down	Channel/Page Up/Down	

While scrolling, hold the key to scroll faster. Use the Page Up/Down control on the remote to scroll a page at a time. Alphabetical Search works as follows. While navigating content, the first press of an Alphanumeric Key jumps to the first item beginning with the first letter on the key. Each additional press cycles through the key's letters, jumping alphabetically through the list of content.

NOTES:

• The Play and Pause functions are not available unless content has been selected for playback by navigating the menu system.

• For the Search function, press and hold the indicated button. Pressing the Previous Track Button once skips to the beginning of the current track. Press the Previous Track Button *twice* to skip to the beginning of the previous track.

While a selection is playing, the song title, artist and album name, if available on the iPod, will appear in the upper line in the front-panel Message Display. The lower line will display the elapsed time of the track on the left, the play mode icon, and the time remaining on the right.

OPERATION

In addition, if a video display is connected to the AVR 354, it will display information about the status of the iPod and the track, including the play mode icon, any art, the song title, artist and album. At the bottom of the screen is a graphic bar indicating the current play position within the track, with the elapsed and remaining times appearing below the bar. If random or repeat play has been programmed, an icon will appear in the upper right corner.

After a period of time, the screen may disappear from view. The length of time is set using the Setup and Slide-In Menus setting in the System Settings menu (described in the Advanced Functions section). You may restore the Now Playing screen to view by pressing either of the ◀/▶ Buttons.

> **NOTE:** It is strongly recommended that you use a screen saver built into your video display to avoid possible damage from "burn-in" that may occur with plasma and many CRT displays when a still image, such as a menu screen, remains on display for an extended period of time.

> **NOTES ON VIDEO PLAYBACK:**
>
> • Before attempting to play videos stored on your iPod, check the Video Settings menu on the iPod and make sure that the TV Out setting is set to On. The TV Signal setting should be NTSC to match the capabilities of your video display. Set Widescreen to On or Off, depending on the aspect ratio of your video display. If your selection was playing and paused, the iPod requires you to reselect the video for the new TV Out setting to take effect.
>
> • In Video mode, the iPod menus will only be visible on its screen. You may operate the iPod using the AVR remote, as long as it is in The Bridge device mode.
>
> • The MP4 and H.264 video formats often used for videos to be played on the iPod are intended for optimal performance on the small screen of the iPod. Playback on larger displays may have different results.

Selecting a Surround Mode

Surround mode selection can be as simple or sophisticated as your individual system and tastes. Feel free to experiment, and you may find a few favorites for certain sources or program types. More detailed information on surround modes may be found in the Advanced Functions section.

To select a surround mode, press the Surround Modes Button (front panel or remote) repeatedly until the desired option appears: SURR: AUTO SELECT, SURR: VIRTUAL, SURR: STEREO, SURR: MOVIE, SURR: MUSIC or SURR: GAME. The option will be displayed in the Lower Line of the Message Display, and the Surround Modes menu will appear on screen (see Figure 62).

Figure 62 – Surround Modes menu

Auto Select: For digital programs, such as movies recorded with a Dolby Digital soundtrack, the AVR will automatically use the native surround format. For two-channel analog and PCM programs, the AVR is programmed to default to Logic 7 Movie mode.

Virtual Surround: When only two main speakers are present in the system, Dolby Virtual Surround may be used to create an enhanced soundfield that virtualizes the missing speakers. Select between Wide and Reference modes, depending on your preferences.

Stereo: When two-channel playback is desired, select the number of speakers used for playback:

• 2 CH STEREO for playback through only two speakers. As described on page 45, you may select Analog Bypass mode for a pure analog signal when analog audio inputs are in use. Simply set the Tone Control setting in the Audio Effects submenu to Off, and the AVR does the rest.

• 5 CH STEREO for playing the left-channel signal through the front and surround left speakers, the right-channel signal through the right speakers and a summed mono signal through the center speaker

• 7 CH STEREO follows the same scheme as 5 CH STEREO, but adds the surround back speakers to the mix. This mode is only available when the surround back speakers are present and have not been reassigned to multizone operation. See the Initial Setup section for more information.

Movie: Select an analog surround mode for movie playback: Logic 7 Movie, DTS Neo:6 Cinema or Dolby Pro Logic II (IIx when seven main speakers are present). The desired mode may also be selected when a compatible digital surround mode is received.

Music: Select an analog surround mode for music playback: Logic 7 Music, DTS Neo:6 Music or Dolby Pro Logic II (IIx when seven main speakers are present). The Dolby Pro Logic II/IIx Music mode allows access to a submenu with some additional settings. See the Advanced Functions section for more information.

Video Game: Select an analog surround mode for game playback: Logic 7 Game, or Dolby Pro Logic II (IIx when seven main speakers are present).

After you have made your selection, press the Back/Exit Button until the screen is cleared.

See the Advanced Functions section for more information on surround modes.

TROUBLESHOOTING GUIDE

SYMPTOM	CAUSE	SOLUTION
Unit does not function when Main Power Switch is pushed	• No AC Power	• Make certain AC power cord is plugged into a live outlet • Check to see whether outlet is switch-controlled
Display lights, but no sound or picture	• Intermittent input connections • **Mute** is on • Volume control is down	• Make certain that all input and speaker connections are secure • Press **Mute Button** • Turn up volume control
No sound from any speaker; PROTECT message appears on front panel	• 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 in line of sight of remote or connect an optional 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 the correct digital input is selected
Surround Back Speaker settings cannot be accessed, and test tone does not play through Surround Back Speakers	• Multizone system has been turned on, and the surround back channels were reassigned to multizone operation	• Use the menu system to access the Zone 2 menu and reassign the surround back channels to the main room.
The XM Preview Channel (001) is silent	• XM antenna is not plugged in • XM antenna is not located in such a way as to enable reception	• Make sure you are using a home audio XM antenna module designed for use with XM Ready home audio equipment, and that the module is plugged into the XM Radio Jack on the rear panel of the receiver. • The XM Antenna module needs to be placed with an unobstructed view of the southern sky, or within range of an XM terrestrial repeater. If necessary, purchase an extension cable from your XM Radio dealer.
Unable to activate Program mode on remote	• Source Selector not held for at least 3 seconds	• The selector will light as you initially press it, and go dark as you hold it down. Wait at least 3 seconds for the selector to light up again.
Remote behaves erratically	• Buttons are pressed too hard	• Always press remote control buttons as gently as possible.
Remote buttons light, but AVR does not respond	• Remote is in Zone 2 mode	• Slide the Zone Switch at the bottom of the remote to the Zone 1 position

Additional information on troubleshooting possible problems with your AVR 354, 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.

Erase a macro as follows:
1. Simultaneously press and hold the Activity Button and the Numeric Key or AVR Power On Button assigned to the activity until the Source Selector or AVR Settings Button lights.
2. Press the Activity Button to erase the macro.

Resetting the Remote
To reset the remote to its factory defaults, simultaneously press and hold the TV Source Selector and the "0" Alphanumeric Key. When the TV Button re-lights, enter the code "333". When the TV Button goes out, and all of the Source Selectors flash, the remote will have been fully reset.

Processor Reset
There may be instances when you wish to fully reset the AVR 354 to its factory defaults, or the unit may behave erratically after a power surge. To correct erratic behavior, first try turning the Master Power Switch off and unplugging the AC power cord for at least three minutes. Plug the cord back in and turn the receiver back on. If this doesn't help, try a system reset.

NOTES:
- A system reset erases all user configurations, including video resolution, speaker and level settings, and tuner presets. After a reset, you will need to reenter all of these settings.

- The RS-232 Reset Button on the rear panel of the AVR 354 does not perform a system reset. DO NOT press the RS-232 Reset Button.

To reset the AVR 354, place the receiver in Standby mode (press the front-panel Standby/On Switch so that the Power Indicator turns amber).
Then press and hold the front-panel OK Button for at least five seconds until the RESET message appears in the display.

Follow the directions in the owner's manual on page 34 to restore the picture if necessary.

If the receiver still does not function correctly after a processor reset, contact an authorized Harman Kardon service center for assistance.
Authorized service centers may be located by visiting our Web site at www.harmankardon.com.

Memory
If the AVR 354 is unplugged or experiences a power outage, it will retain user settings for up to four weeks.

1. Removing the Top Cabinet
Remove the Screws ① ~ ⑬
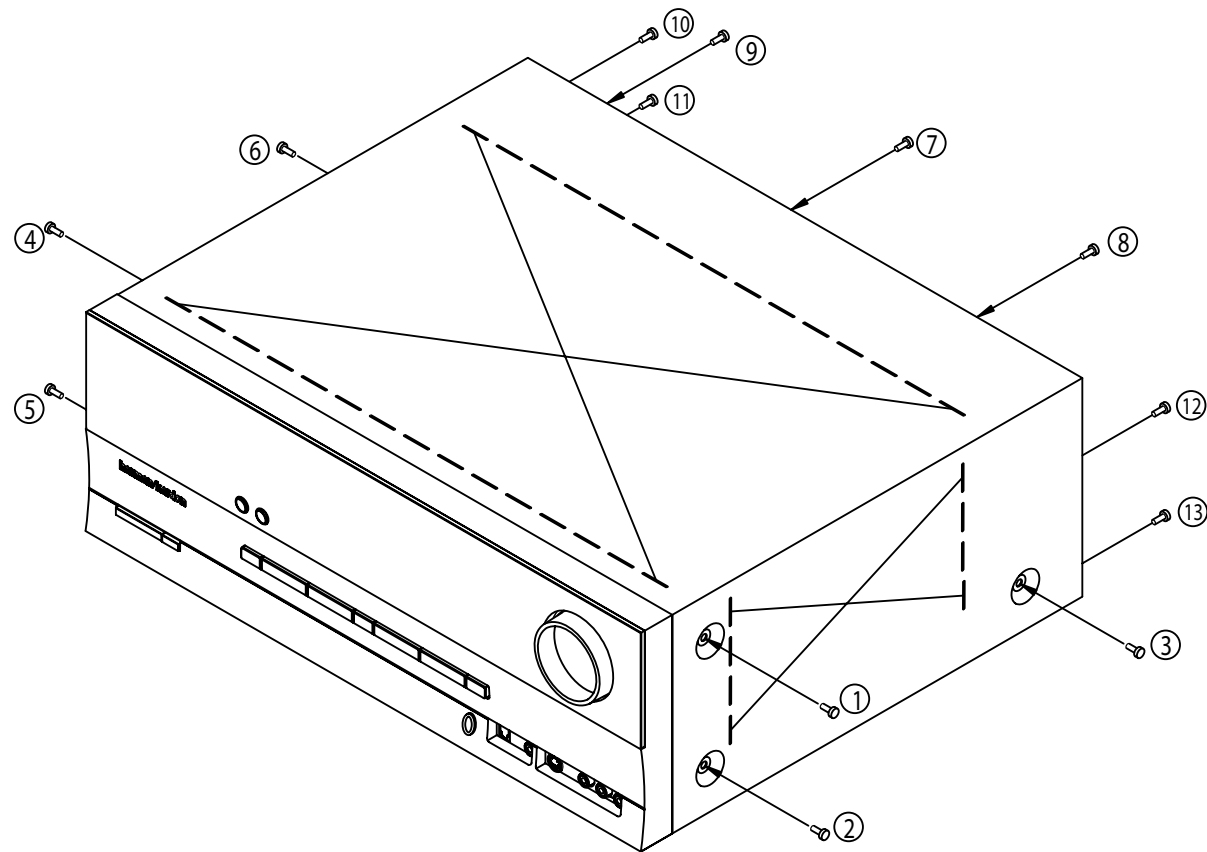
2. Removing the Front Panel
Remove the Screws ① ~ ⑨
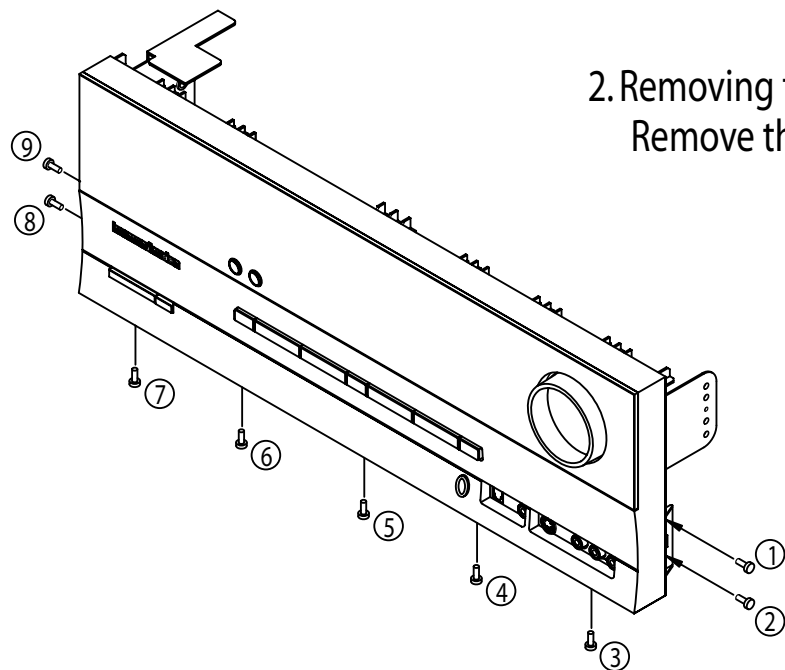
3. Removing the Rear Panel
Remove the Screws ① ~ ㉟
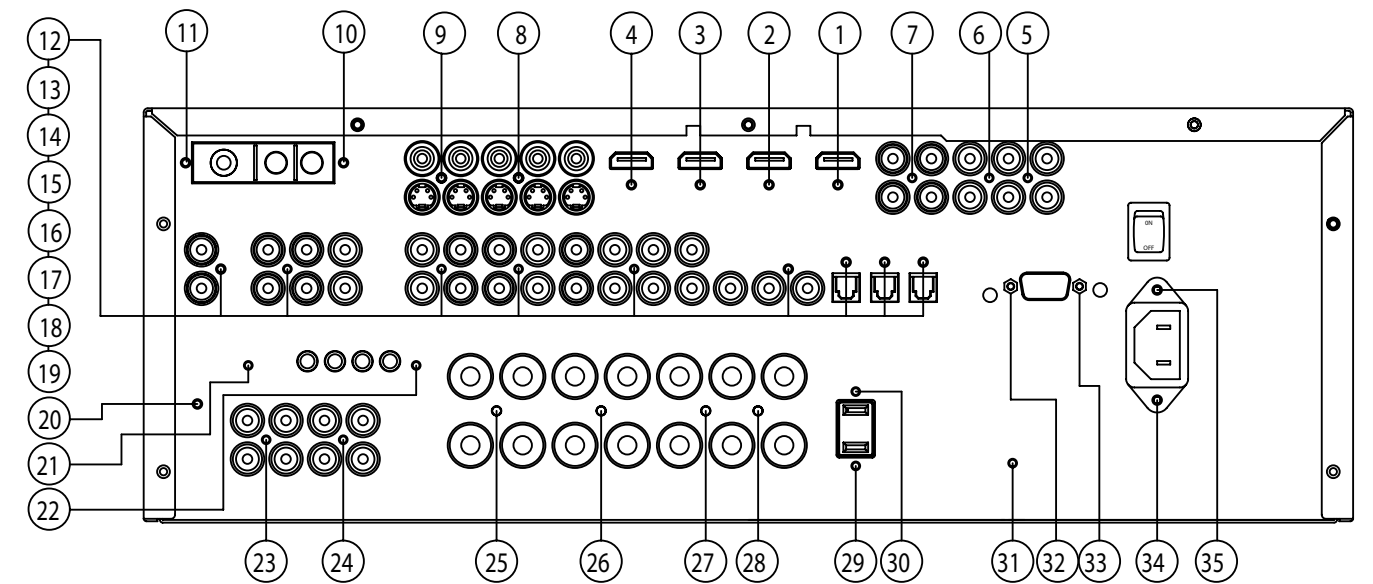
4. Removing the Main PCB
Remove the Screws ① ~ ⑦

AVR354 EXPLODED VIEW

LARGER PARTS CHART
NEXT PAGE
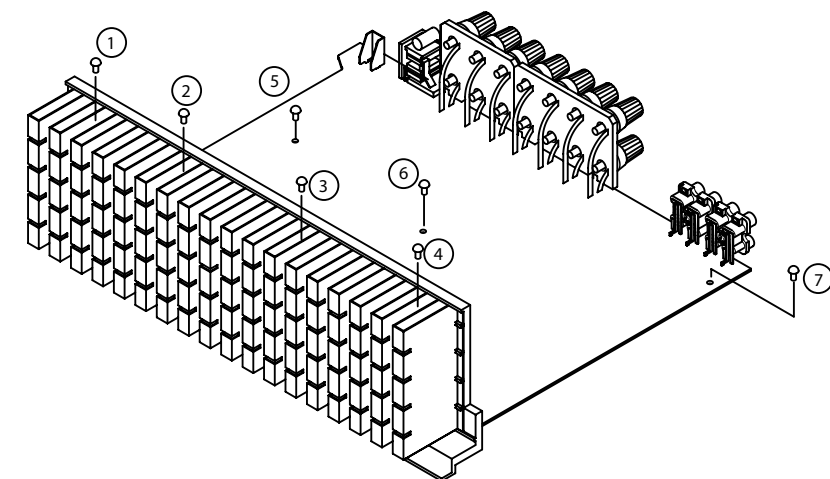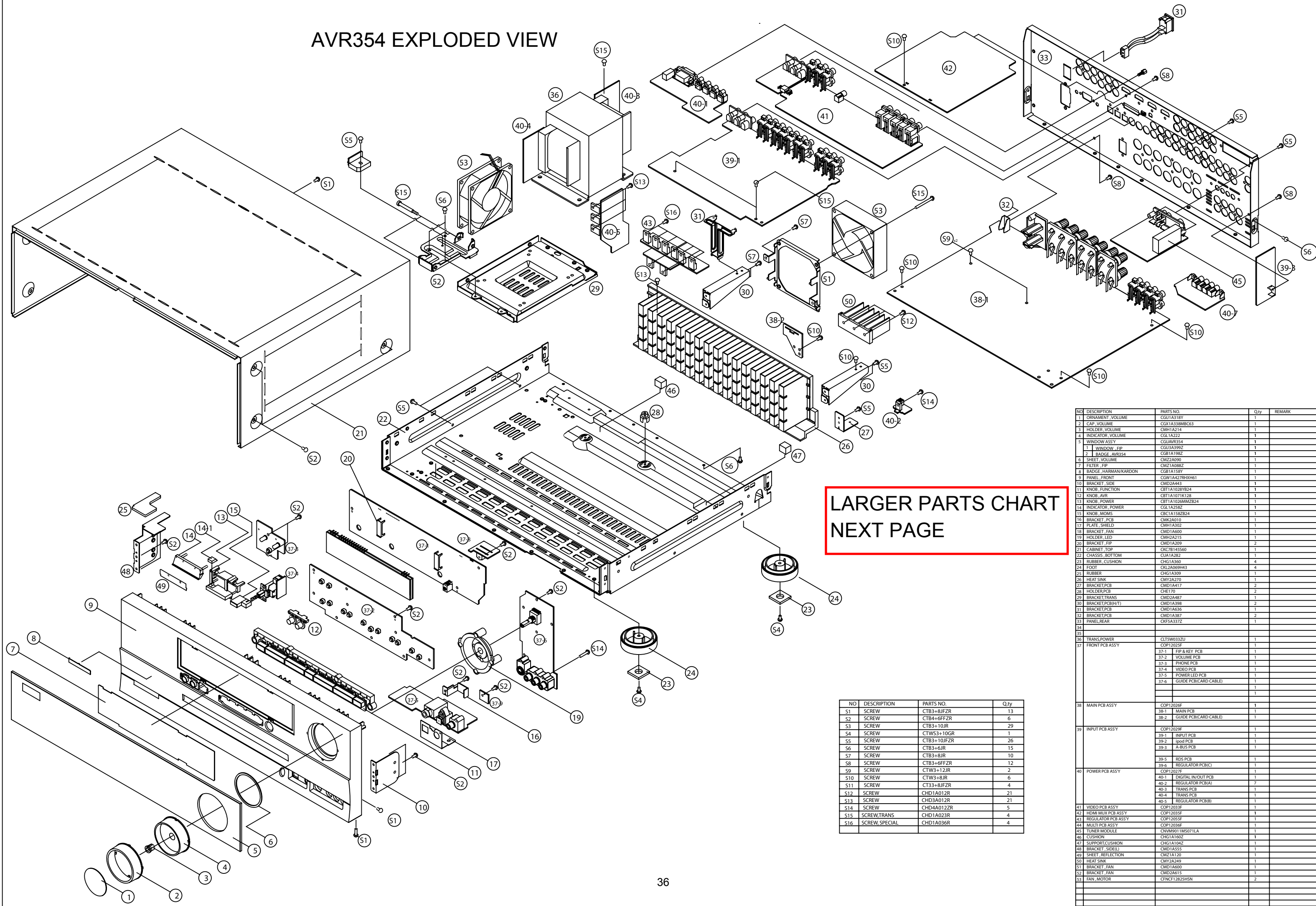
NO	DESCRIPTION	PARTS NO.	Q.ty
S1	SCREW	CTB3+8JFZR	13
S2	SCREW	CTB4+6FFZR	6
S3	SCREW	CTB3+10JR	29
S4	SCREW	CTWS3+10GR	1
S5	SCREW	CTB3+10JFZR	26
S6	SCREW	CTB3+6JR	15
S7	SCREW	CTB3+8JR	10
S8	SCREW	CTB3+6FFZR	12
S9	SCREW	CTW3+12JR	2
S10	SCREW	CTW3+8JR	6
S11	SCREW	CT33+8JFZR	4
S12	SCREW	CHD1A012R	21
S13	SCREW	CHD3A012R	21
S14	SCREW	CHD4A012ZR	5
S15	SCREW;TRANS	CHD1A023R	4
S16	SCREW, SPECIAL	CHD1A036R	4

NO	DESCRIPTION	PARTS NO.	Q.ty	REMARK
1	ORNAMENT , VOLUME	CGU1A318Y	1	
2	CAP ,VOLUME	CGX1A338MBC63	1	
3	HOLDER ,VOLUME	CMH1A214	1	
4	INDICATOR , VOLUME	CGL1A222	1	
5	WINDOW ASS'Y	CGUAVR354	1	
1	WINDOW , FIP	CGU3A399Z	1	
2	BADGE , AVR354	CGB1A198Z	1	
6	SHEET , VOLUME	CMZ2A090	1	
7	FILTER ,FIP	CMZ1A088Z	1	
8	BADGE , HARMAN/KARDON	CGB1A158Y	1	
9	PANEL , FRONT	CGW1A427RHXH61	1	
10	BRACKET , SIDE	CMD2A443	1	
11	KNOB , FUNCTION	CBT1A1028YB24	1	
12	KNOB , AVR	CBT1A1071K128	1	
13	KNOB , POWER	CBT1A1026MMZB24	1	
14	INDICATOR , POWER	CGL1A258Z	1	
15	KNOB ,MOMS	CBC1A158ZB24	1	
16	BRACKET , PCB	CMK2A010	1	
17	PLATE , SHIELD	CMH1A302	1	
18	BRACKET , FAN	CMD1A600	1	
19	HOLDER , LED	CMH2A215	1	
20	BRACKET , FIP	CMD1A209	2	
21	CABINET , TOP	CKC7B14S560	1	
22	CHASSIS , BOTTOM	CUA1A282	1	
23	RUBBER , CUSHION	CHG1A360	4	
24	FOOT	CKL2A069H43	4	
25	RUBBER	CHG1A309	1	
26	HEAT SINK	CMY2A270	1	
27	BRACKET,PCB	CMD1A417	2	
28	HOLDER,PCB	CHE170	2	
29	BRACKET,TRANS	CMD2A487	1	
30	BRACKET,PCB(H/T)	CMD1A398	2	
31	BRACKET,PCB	CMD1A636	1	
32	BRACKET,PCB	CMD1A387	2	
33	PANEL,REAR	CKF5A337Z	1	
34				
35				
36	TRANS,POWER	CLT5W033ZU	1	
37	FRONT PCB ASS'Y	COP12025F	1	
37-1	FIP & KEY PCB		1	
37-2	VOLUME PCB		1	
37-3	PHONE PCB		1	
37-4	VIDEO PCB		1	
37-5	POWER LED PCB		1	
37-6	GUIDE PCB(CARD CABLE)		1	
38	MAIN PCB ASS'Y	COP12026F	1	
38-1	MAIN PCB		1	
38-2	GUIDE PCB(CARD CABLE)		1	
39	INPUT PCB ASS'Y	COP12029F	1	
39-1	INPUT PCB		1	
39-2	ipod PCB		1	
39-3	A-BUS PCB		1	
39-5	RDS PCB		1	
39-6	REGULATOR PCB(C)		1	
40	POWER PCB ASS'Y	COP12027F	1	
40-1	DIGITAL IN/OUT PCB		1	
40-2	REGULATOR PCB(A)		7	
40-3	TRANS PCB		1	
40-4	TRANS PCB		1	
40-5	REGULATOR PCB(B)		1	
41	VIDEO PCB ASS'Y	COP12033F	1	
42	HDMI MUX PCB ASS'Y	COP12035F	1	
43	REGULATOR PCB ASS'Y	COP12055F	1	
44	MULTI PCB ASS'Y	COP12036F	1	
45	TUNER MODULE	CNVM9011MS071LA	1	
46	CUSHION	CHG1A160Z	1	
47	SUPPORT,CUSHION	CHG1A104Z	1	
48	BRACKET , SIDE(L)	CMD1A555	1	
49	SHEET , REFLECTION	CMZ1A120	1	
50	HEAT SINK	CMY2A249	1	
51	BRACKET , FAN	CMD1A600	1	
52	BRACKET , FAN	CMD2A615	1	
53	FAN , MOTOR	CFNCF12825HSN	2	

NO	DESCRIPTION		PART NO.	Qty
1	ORNAMENT , VOLUME		CGU1A318Y	1
2	CAP , VOLUME		CGX1A338MBC63	1
3	HOLDER , VOLUME		CMH1A214	1
4	INDICATOR , VOLUME		CGL1A222	1
5	WINDOW ASS'Y		CGUAVR354	1
	1	WINDOW , FIP	CGU3A399Z	1
	2	BADGE , AVR354	CGB1A198Z	1
6	SHEET , VOLUME		CMZ2A090	1
7	FILTER , FIP		CMZ1A088Z	1
8	BADGE , HARMAN/KARDON		CGB1A158Y	1
9	PANEL , FRONT		CGW1A427RHXH61	1
10	BRACKET , SIDE		CMD2A443	1
11	KNOB , FUNCTION		CBT1A1028YB24	1
12	KNOB , AVR		CBT1A1071K128	1
13	KNOB , POWER		CBT1A1026MMZB24	1
14	INDICATOR , POWER		CGL1A258Z	1
15	KNOB , MOMS		CBC1A158ZB24	1
16	BRACKET , PCB		CMK2A010	1
17	PLATE , SHIELD		CMH1A302	1
18	BRACKET , FAN		CMD1A600	1
19	HOLDER , LED		CMH2A215	1
20	BRACKET , FIP		CMD1A209	2
21	CABINET , TOP		CKC7B145S60	1
22	CHASSIS , BOTTOM		CUA1A282	1
23	RUBBER , CUSHION		CHG1A360	4
24	FOOT		CKL2A069H43	4
25	RUBBER		CHG1A309	1
26	HEAT SINK		CMY2A270	1
27	BRACKET,PCB		CMD1A417	2
28	HOLDER,PCB		CHE170	2
29	BRACKET,TRANS		CMD2A487	1
30	BRACKET,PCB(H/T)		CMD1A398	2
31	BRACKET,PCB		CMD1A636	1
32	BRACKET,PCB		CMD1A387	2
33	PANEL,REAR		CKF5A337Z	1
34				
35				
36	TRANS,POWER			1
37	FRONT PCB ASS'Y			1
		37-1	FIP & KEY PCB	1
		37-2	VOLUME PCB	1
		37-3	PHONE PCB	1
		37-4	VIDEO PCB	1
		37-5	POWER LED PCB	1
		37-6	GUIDE PCB(CARD CABLE)	1
				1
				1
38	MAIN PCB ASS'Y			1
		38-1	MAIN PCB	1
		38-2	GUIDE PCB(CARD CABLE)	1
39	INPUT PCB ASS'Y			1
		39-1	INPUT PCB	1
		39-2	ipod PCB	1
		39-3	A-BUS PCB	1
		39-5	RDS PCB	1
		39-6	REGULATOR PCB(C)	1
40	POWER PCB ASS'Y			1
		40-1	DIGITAL IN/OUT PCB	1
		40-2	REGULATOR PCB(A)	7
		40-3	TRANS PCB	1
		40-4	TRANS PCB	1
		40-5	REGULATOR PCB(B)	1
41	VIDEO PCB ASS'Y			1
42	HDMI MUX PCB ASS'Y			1
43	REGULATOR PCB ASS'Y			1
44	MULTI PCB ASS'Y			1
45	TUNER MODULE		CNVM9011MS071LA	1
46	CUSHION		CHG1A160Z	1
47	SUPPORT,CUSHION		CHG1A104Z	1
48	BRACKET , SIDE(L)		CMD1A555	1
49	SHEET , REFLECTION		CMZ1A120	1
50	HEAT SINK		CMY2A249	1
51	BRACKET , FAN		CMD1A600	1
52	BRACKET , FAN		CMD2A615	1
53	FAN , MOTOR		CFNCF12825HSN	2

AMPLIFIER SECTION BIAS ADJUSTMENT

Measurement condition
.No input signal or volume position is minimum.

Standard value
.Ideal current = 48mA (± 5%)
.Ideal DC Voltage = 25.92mV (± 5%)
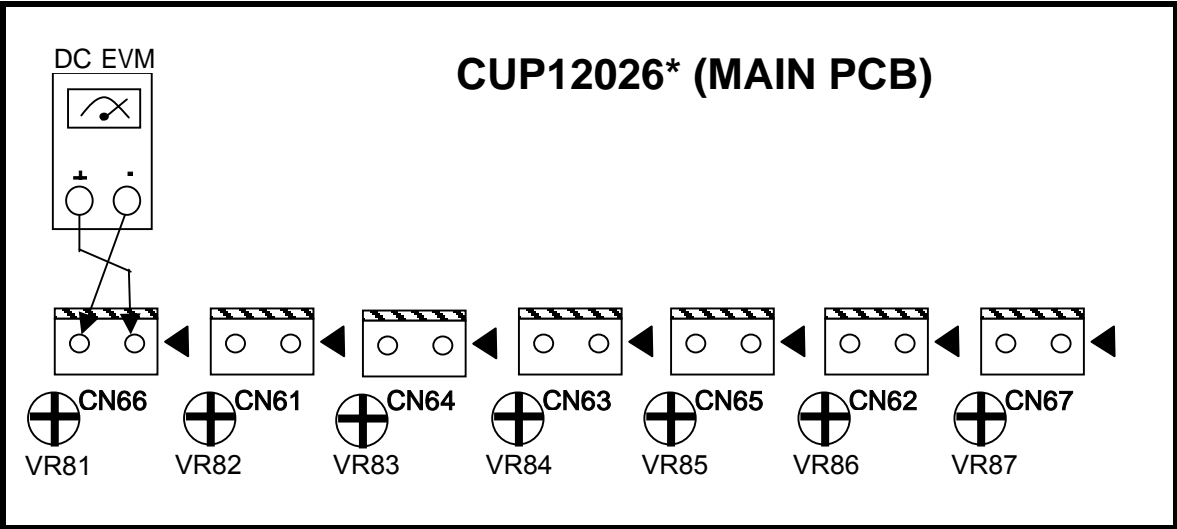
DC VOLTMETER ; Connect to
 CN66(SL),CN61(CEN),CN64(SR),CN63(FL),CN65(SBL(AVR254,255,354,355)),CN62(FR),CN67(SBR)

NO.	Channel	Adjust for	Adjustment
1	Front Left	25.92mV (± 5%)	CN63
2	Front Right	25.92mV (± 5%)	CN62
3	Center	25.92mV (± 5%)	CN61
4	Surround Left	25.92mV (± 5%)	CN66
5	Surround Right	25.92mV (± 5%)	CN64
6	Surround Back Left	25.92mV (± 5%)	CN65
7	Surround Back Right	25.92mV (± 5%)	CN67

AVR254/255/354/355 BLOCK DIAGRAM

REVISION	2		4		6	
1		3		5		7

SCHEMATIC DIAGRAM				SHEET
MODEL	AVR254/255/354/355			1 / 1
DESIGN	CHECK	APPROVE	DRAWING NO	
S.H.Yang	W.Y.Yang	G.S.Wey	BLOCK DIAGRAM	
08.02.25	08.02.25	08.02.25	2024BLDZ	1/1

M/P

ISSUE

2008.02.25
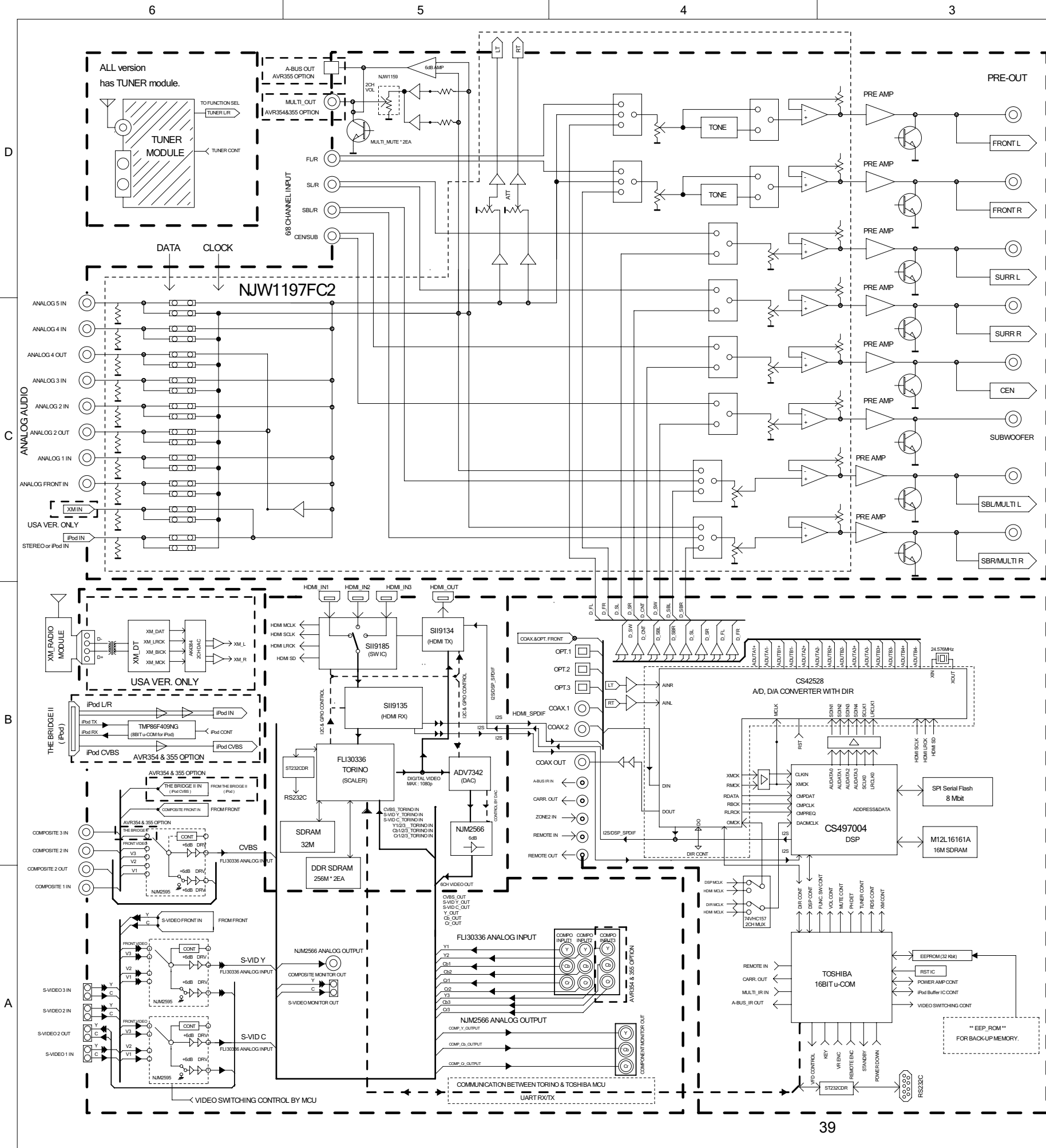
AVR354 Electrical Parts List					
Ref. Designator	Part Number	Description		Qty	
FRONT PCB ASSY	**CUP12025**				
Capacitors					
C714	CCBS1H151KBT	CAP , CERAMIC	150UF 50V K	1	EA
C716	CCEA1AH331T	CAP , ELECT	330UF 10V	1	EA
C719	CCBS1H102KBT	CAP , CERAMIC	1000PF 50V K	1	EA
C720	CCBS1H102KBT	CAP , CERAMIC	1000PF 50V K	1	EA
C721	CCBS1H102KBT	CAP , CERAMIC	1000PF 50V K	1	EA
C723	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C728	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C729	CCBS1H473ZFT	CAP , CERAMIC	0.047UF 50V Z	1	EA
C735	CCEA1CKS100T	CAP , ELECT	10UF 16V	1	EA
C742	CCBS1H223ZFT	CAP , CERAMIC	0.022UF 50V Z	1	EA
C793	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C794	CCBS1C222MXT	CAP , CERAMIC	2200PF 16V	1	EA
C795	CCBS1H102KBT	CAP , CERAMIC	1000PF 50V K	1	EA
C796	CCBS1H102KBT	CAP , CERAMIC	1000PF 50V K	1	EA
C805	CCBS1H223ZFT	CAP , CERAMIC	0.022UF 50V Z	1	EA
C806	CCBS1H223ZFT	CAP , CERAMIC	0.022UF 50V Z	1	EA
C807	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C808	CCBS1H181KBT	CAP , CERAMIC	180PF 50V	1	EA
C809	CCEA1AH471T	CAP , ELECT	470UF 10V	1	EA
C812	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C817	CCBS1H100JCT	CAP , CERAMIC	10PF 50V	1	EA
C820	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C821	CCEA1EH470T	CAP , ELECT	47UF 25V	1	EA
C822	CCEA1EH470T	CAP , ELECT	47UF 25V	1	EA
C823	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C824	CCBS1H471KBT	CAP , CERAMIC	470PF 50V	1	EA
C825	CCBS1H151KBT	CAP , CERAMIC	150PF 50V	1	EA
C828	CCBS1H470JT	CAP , CERAMIC	47PF 50V	1	EA
C830	CCBS1H473ZFT	CAP , CERAMIC	0.047F 50V	1	EA
C841	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C842	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C843	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C850	CCBS1H471KBT	CAP , CERAMIC	470PF 50V	1	EA
C851	CCBS1H471KBT	CAP , CERAMIC	470PF 50V	1	EA
C852	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C855	CCBS1H101KBT	CAP , CERAMIC	100PF 50V K	1	EA
C856	CCBS1H101KBT	CAP , CERAMIC	100PF 50V K	1	EA
C857	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C862	CCBS1H101KBT	CAP , CERAMIC	100PF 50V K	1	EA
C863	CCBS1H101KBT	CAP , CERAMIC	100PF 50V K	1	EA
C866	CCEA1HKS100T	CAP , ELECT	10UF 50V SMALL SIZE	1	EA
C867	CCEA1HKS100T	CAP , ELECT	10UF 50V SMALL SIZE	1	EA
C868	CCEA1EKS470T	CAP , ELECT	47UF 25V	1	EA
C869	CCEA1EKS470T	CAP , ELECT	47UF 25V	1	EA
C870	CCBS1H681KBT	CAP , CERAMIC	680PF 50V K	1	EA
C871	CCBS1H681KBT	CAP , CERAMIC	680PF 50V K	1	EA
C872	CCEA1CH331T	CAP , ELECT	330UF 16V	1	EA
C873	CCEA1CH331T	CAP , ELECT	330UF 16V	1	EA
C874	CCBS1H101KBT	CAP , CERAMIC	100PF 50V K	1	EA
C882	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C888	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C889	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C891	CCBS1H223ZFT	CAP , CERAMIC	0.022UF 50V Z	1	EA
C892	CCBS1H223ZFT	CAP , CERAMIC	0.022UF 50V Z	1	EA
C893	CCBS1H223ZFT	CAP , CERAMIC	0.022UF 50V Z	1	EA
C894	CCEA1CKS100T	CAP , ELECT	10UF 16V	1	EA
C896	CCBS1H223ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA

Ref. Designator	Part Number	Description		Qty	
FRONT PCB ASSY		**CUP12025**			
C897	CCEA1AH471T	CAP , ELECT	470UF 10V	1	EA
C903	CCEA1HKS2R2T	CAP , ELECT	2.2UF 50V SMALL SIZE	1	EA
C905	CCEA1HKS2R2T	CAP , ELECT	2.2UF 50V SMALL SIZE	1	EA
Semiconductors					
D455	CVD1SS133MT	DIODE	1SS133	1	EA
D730		WIRE , COPPER	SN95/PB5 , 0.6	1	EA
D774	CVD1SS133MT	DIODE	1SS133	1	EA
D775	CVD1SS133MT	DIODE	1SS133	1	EA
D784	CVD1SS133MT	DIODE	1SS133	1	EA
D785	CVD1SS133MT	DIODE	1SS133	1	EA
Q451	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
Q452	HVTKRA107MT	TRANSISTOR PNP	KRA107M	1	EA
Q454	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
Q701	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
Q722	HVTKRA107MT	TRANSISTOR PNP	KRA107M	1	EA
Q724	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
Q725	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
Q734	HVTKTC2874BT	TRANSISTOR , MUTE NPN	KTC2874B	1	EA
Q735	HVTKTC2874BT	TRANSISTOR , MUTE NPN	KTC2874B	1	EA
Q736	HVTKTC2874BT	TRANSISTOR , MUTE NPN	KTC2874B	1	EA
Q737	HVTKTC2874BT	TRANSISTOR , MUTE NPN	KTC2874B	1	EA
Q738	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
Q739	HVTKTA1271YT	TRANSISTOR PNP	KTA1271Y	1	EA
Q740	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
IC73	HRVNJL34H380A	SENSOR , REMOCON	SENSOR	1	EA
IC75	HVI74ACT04MTR	I.C , HEX INVERTER	JRC(74ACT04MTR)	1	EA
IC76	HVI74HCU04AFNG	I.C , INVERTER	FAIRCHILD(74HCU04AFNG)	1	EA
IC86	HVINJM4556AL	I.C , DUAL OP AMP	JRC(NJM4556AL)	1	EA
IC87	HVINJM2068MTE1	I.C , DUAL OP AMP	JRC(NJM2068MTE1)	1	EA
D778	HVD1N5819T	DIODE , SCHOTTKY	1N5819	1	EA
D786	CVD1SS133MT	DIODE	1SS133	1	EA
D787	CVD1SS133MT	DIODE	1SS133	1	EA
D701	CVD1L0345W31BOCT20	L.E.D , WHITE	LED	1	EA
D703	CVD1L0345W31BOCT20	L.E.D , WHITE	LED	1	EA
D705	CVD1L0345W31BOCT20	L.E.D , WHITE	LED	1	EA
D723	CVD30ASOGCAA-S7	L.E.D , ORANGE	LED	1	EA
D724	CVD30ASOGCAA-S7	L.E.D , ORANGE	LED	1	EA
D727	CVD1L0345W31BOCT20	L.E.D , WHITE	LED	1	EA
D728	CVD1L0345W31BOCT20	L.E.D , WHITE	LED	1	EA
Resistors					
R452	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R453	CRD20TJ362T	RES , CARBON	3.6K OHM 1/5W J	1	EA
R454	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R701	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R704	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R705	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1	EA
R706	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1	EA
R708	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1	EA
R709	CRD20TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R710	CRD20TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R711	CRD20TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R718	CRD20TJ222T	RES , CARBON	2.2K OHM 1/5W J	1	EA
R721	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1	EA
R722	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R723	CRD20TJ393T	RES , CARBON	39K OHM 1/5W J	1	EA
R724	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R725	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA

Ref. Designator	Part Number	Description		Qty	
FRONT PCB ASSY		**CUP12025**			
R737	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R747	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R753	CRD20TF1001T	RES , CARBON	1K /1/5W /F	1	EA
R754	CRD20TF1501T	RES , CARBON	1.5K /1/5W /F	1	EA
R755	CRD20TF1801T	RES , CARBON	1.8K /1/5W /F	1	EA
R756	CRD20TF2701T	RES , CARBON	2.7K /1/5W/F	1	EA
R757	CRD20TF3301T	RES , CARBON	3.3K /1/5W/F	1	EA
R758	CRD20TF5601T	RES , CARBON	5.6K /1/5W/F	1	EA
R759	CRD20TF1001T	RES , CARBON	1K /1/5W /F	1	EA
R760	CRD20TF1501T	RES , CARBON	1.5K /1/5W /F	1	EA
R761	CRD20TF1801T	RES , CARBON	1.8K /1/5W /F	1	EA
R762	CRD20TF2701T	RES , CARBON	2.7K /1/5W/F	1	EA
R763	CRD20TF3301T	RES , CARBON	3.3K /1/5W/F	1	EA
R764	CRD20TF5601T	RES , CARBON	5.6K /1/5W/F	1	EA
R765	CRD20TF7501T	RES , CARBON	7.5K /1/5W/F	1	EA
R781	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R782	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R783	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R784	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R786	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R787	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1	EA
R791	CRD20TJ123T	RES , CARBON	12K OHM 1/5W J	1	EA
R805	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R806	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R824	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R825	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1	EA
R828	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R829	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1	EA
R864	CRD20TJ272T	RES , CARBON	2.7K OHM 1/5W J	1	EA
R865	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1	EA
R866	CRD20TJ272T	RES , CARBON	2.7K OHM 1/5W J	1	EA
R869	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R871	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R872	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R873	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1	EA
R874	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1	EA
R875	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R876	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R877	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R878	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R892	CRD20TJ222T	RES , CARBON	2.2K OHM 1/5W J	1	EA
R893	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1	EA
R895	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1	EA
R896	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1	EA
R897	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1	EA
R898	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1	EA
R899	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R900	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R901	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R902	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R903	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R904	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R905	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R906	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R907	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R908	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R909	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R910	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R911	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R912	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R913	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA

Ref. Designator	Part Number	Description		Qty	
FRONT PCB ASSY		**CUP12025**			
R915	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	1	EA
R918	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R919	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R920	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R921	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R922	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R923	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1	EA
R924	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1	EA
R926	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R931	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R934	CRD20TJ222T	RES , CARBON	2.2K OHM 1/5W J	1	EA
R935	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R936	CRD20TJ222T	RES , CARBON	2.2K OHM 1/5W J	1	EA
R937	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
VR74	CSR2A037Z	ENCODER	ENCODER	1	EA
Miscellaneous					
L702	HLQ02C100KT	COIL , AXAIL		1	EA
S701	HST1A020ZT	SW , TACT	TACT SWITCH	1	EA
S702	HST1A020ZT	SW , TACT	TACT SWITCH	1	EA
S703	HST1A020ZT	SW , TACT	TACT SWITCH	1	EA
S704	HST1A020ZT	SW , TACT	TACT SWITCH	1	EA
S705	HST1A020ZT	SW , TACT	TACT SWITCH	1	EA
S706	HST1A020ZT	SW , TACT	TACT SWITCH	1	EA
S707	HST1A020ZT	SW , TACT	TACT SWITCH	1	EA
S708	HST1A020ZT	SW , TACT	TACT SWITCH	1	EA
S709	HST1A020ZT	SW , TACT	TACT SWITCH	1	EA
S711	HST1A020ZT	SW , TACT	TACT SWITCH	1	EA
S712	HST1A020ZT	SW , TACT	TACT SWITCH	1	EA
S713	HST1A020ZT	SW , TACT	TACT SWITCH	1	EA
S714	HST1A020ZT	SW , TACT	TACT SWITCH	1	EA
S715	HST1A020ZT	SW , TACT	TACT SWITCH	1	EA
BK71	CMD1A209	BRACKET , FLT	BRACKET	1	EA
BK72	CMD1A209	BRACKET , FLT	BRACKET	1	EA
BN10	CWZAVR155BN10	SHIELD WIRE ASS'Y(5P, 2MM, 350MM)	WIRE	1	EA
BN18	CWZAVR355BN18	SHIELD WIRE ASS'Y (5P, 500MM)	WIRE	1	EA
BN22	CWZAVR155BN22	WIRE ASS'Y(7P, 2MM, 500MM)	WIRE	1	EA
BN41	CWZAVR155BN41	SHIELD WIRE ASS'Y(7P, 2MM, 500MM)	WIRE	1	EA
BN81	CWB1C907200BM	WIRE ASS'Y	WIRE	1	EA
BN84	CWB2B905080EN	WIRE ASS'Y	WIRE	1	EA
BN85	CWB2B903100EW	WIRE ASS'Y	WIRE	1	EA
BN88	CWB2B905100EN	WIRE ASS'Y	WIRE	1	EA
BN89	CWB2B905100EN	WIRE ASS'Y	WIRE	1	EA
BN92	CWB2B907120EN	WIRE ASS'Y	WIRE	1	EA
CN72	CJP17GA117ZY	WAFER	WAFER	1	EA
CN84	CJP05GB46ZY	WAFER	WAFER	1	EA
CN85	CJP03GA19ZY	WAFER , STRAIGHT(3PIN)	WAFER	1	EA
CN86	CJP02GA89ZM	WAFER	WAFER	1	EA
CN88	CJP05GB46ZY	WAFER	WAFER	1	EA
CN89	CJP05GB46ZY	WAFER	WAFER	1	EA
CN92	CJP07GA19ZY	WAFER , STRAIGHT(7PIN)	WAFER	1	EA
ET03	CMD1A629	BRACKET , PCB	BRACKET	1	EA
FIP1	CFL17BT031GINK	F.I.P , AVR355	FIP(FUTABA)	1	EA
JK81	CJJ4M041Y	JACK , BOARD (COAX)	JACK	1	EA
JK82	HJSTORX177L	MODULE , OPTICAL(RX)	TORX177L	1	EA
JK83	CJJ2E026Z	JACK , HEADPHONE(SILVER PLATE)	JACK	1	EA
JK85	CJJ9M003Z	JACK , S-VIDEO	JACK	1	EA
JK86	CJJ4S023Y	JACK , BOARD	JACK	1	EA
JW82	CWE8202300RV	WIRE ASS'Y	WIRE	1	EA
JW83	CWE8202150RV	WIRE ASS'Y	WIRE	1	EA

Ref. Designator	Part Number	Description		Qty	
FRONT PCB ASSY		**CUP12025**			
JW84	CWE8202110RV	WIRE ASS'Y	WIRE	1	EA
JW88	CWE8202150RV	WIRE ASS'Y	WIRE	1	EA
RL45	CSL4A016ZU	RELAY , 12V 2C2P	RELAY	1	EA
SW1	CSH1A008ZV	SW , PUSH (MOMS)	SWITCH	1	EA
VR74	CSR2A037Z	ENCODER	ENCODER	1	EA
	CHG1A306	CUSHION	CUSHION	1	EA
	CMC3A111	PLATE , EARTH	Plate, earth	1	EA
MAIN PCB/HEATSINK		**(CUP12026)**			
Capacitors					
C501	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C502	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C503	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C504	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C505	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C506	CCKT1H331KB	CAP , CERAMIC	330PF 50V	1	EA
C507	CCBS1H331KBT	CAP , CERAMIC	330PF 50V	1	EA
C508	CCBS1H331KBT	CAP , CERAMIC	330PF 50V	1	EA
C509	CCKT1H331KB	CAP , CERAMIC	330PF 50V	1	EA
C510	CCBS1H331KBT	CAP , CERAMIC	330PF 50V	1	EA
C561	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C562	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C564	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C565	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C566	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C567	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C568	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C569	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C570	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C571	CCBS1H681KBT	CAP , CERAMIC	680PF 50V	1	EA
C572	CCBS1H681KBT	CAP , CERAMIC	680PF 50V	1	EA
C573	CCBS1H681KBT	CAP , CERAMIC	680PF 50V	1	EA
C574	CCBS1H681KBT	CAP , CERAMIC	680PF 50V	1	EA
C575	CCBS1H681KBT	CAP , CERAMIC	680PF 50V	1	EA
C601	CCCT1H120JC	CAP , CERAMIC	12PF 50V J	1	EA
C602	CCCT1H120JC	CAP , CERAMIC	12PF 50V J	1	EA
C603	CCCT1H120JC	CAP , CERAMIC	12PF 50V J	1	EA
C604	CCCT1H120JC	CAP , CERAMIC	12PF 50V J	1	EA
C605	CCCT1H120JC	CAP , CERAMIC	12PF 50V J	1	EA
C606	CCCT1H330JC	CAP , CERAMIC	33PF 50V J	1	EA
C607	CCCT1H330JC	CAP , CERAMIC	33PF 50V J	1	EA
C608	CCCT1H330JC	CAP , CERAMIC	33PF 50V J	1	EA
C609	CCCT1H330JC	CAP , CERAMIC	33PF 50V J	1	EA
C610	CCCT1H330JC	CAP , CERAMIC	33PF 50V J	1	EA
C681	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C682	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C683	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C684	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C685	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C721	CCKT1H221KB	CAP , CERAMIC	220PF 50V K	1	EA
C722	CCKT1H221KB	CAP , CERAMIC	220PF 50V K	1	EA
C723	CCKT1H221KB	CAP , CERAMIC	220PF 50V K	1	EA
C724	CCKT1H221KB	CAP , CERAMIC	220PF 50V K	1	EA
C725	CCKT1H221KB	CAP , CERAMIC	220PF 50V K	1	EA
C726	CCKT1H221KB	CAP , CERAMIC	220PF 50V K	1	EA
C727	CCKT1H221KB	CAP , CERAMIC	220PF 50V K	1	EA
C728	CCKT1H221KB	CAP , CERAMIC	220PF 50V K	1	EA
C801	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C802	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA

Ref. Designator	Part Number	Description		Qty	
MAIN PCB/HEATSINK		**(CUP12026)**			
C803	CCCT1H330JC	CAP , CERAMIC	33PF 50V J	1	EA
C804	CCCT1H330JC	CAP , CERAMIC	33PF 50V J	1	EA
C805	CCCT1H120JC	CAP , CERAMIC	12PF 50V J	1	EA
C806	CCCT1H120JC	CAP , CERAMIC	12PF 50V J	1	EA
C811	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C812	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C813	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C814	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C815	CCKT1H331KB	CAP , CERAMIC	330PF 50V K	1	EA
C816	CCBS1H331KBT	CAP , CERAMIC	330PF 50V	1	EA
C817	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C818	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C819	CCBS1H681KBT	CAP , CERAMIC	680PF 50V	1	EA
C820	CCBS1H681KBT	CAP , CERAMIC	680PF 50V	1	EA
C900	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C901	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C905	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1	EA
C907	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C908	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1	EA
C910	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C911	CCEA1CH471T	CAP , ELECT	470UF 16V	1	EA
C912	CCEA1EH221T	CAP , ELECT	220UF 25V	1	EA
C913	CCFT1H104ZF	CAP , SEMICONDUCTOR	0.1UF 50V Z	1	EA
C914	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C917	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C918	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C919	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C924	CCFT1H104ZF	CAP , SEMICONDUCTOR	0.1UF 50V Z	1	EA
C925	CCFT1H104ZF	CAP , SEMICONDUCTOR	0.1UF 50V Z	1	EA
C932	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C933	CCEA1CH221T	CAP , ELECT	220UF 16V	1	EA
C934	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1	EA
C939	CCEA1HH4R7T	CAP , ELECT	4.7UF 50V	1	EA
C940	CCEA1AH471T	CAP , ELECT	470UF 10V	1	EA
C948	CCFT1H104ZF	CAP , SEMICONDUCTOR	0.1UF 50V Z	1	EA
C950	CCEA1AH471T	CAP , ELECT	470UF 10V	1	EA
C971	HCQI1H562JZT	CAP , MYLAR	5600PF 50V J	1	EA
C972	HCQI1H562JZT	CAP , MYLAR	5600PF 50V J	1	EA
C973	HCQI1H562JZT	CAP , MYLAR	5600PF 50V J	1	EA
C974	HCQI1H562JZT	CAP , MYLAR	5600PF 50V J	1	EA
C975	HCQI1H562JZT	CAP , MYLAR	5600PF 50V J	1	EA
C977	CCEA1HH3R3T	CAP , ELECT	33UF 25V	1	EA
C980	HCQI1H562JZT	CAP , MYLAR	5600PF 50V J	1	EA
C981	HCQI1H562JZT	CAP , MYLAR	5600PF 50V J	1	EA
C990	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C991	CCEA1HH1R0T	CAP , ELECT	1UF 50V	1	EA
C992	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C993	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C994	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C995	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C996	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C997	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C999	CCFT1H223ZF	CAP , CERAMIC	0.022UF 50V Z	1	EA
C563	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C631	CCEA1JH221E	CAP , ELECT	220UF 63V	1	EA
C632	CCEA1JH221E	CAP , ELECT	220UF 63V	1	EA
C633	CCEA1JH221E	CAP , ELECT	220UF 63V	1	EA
C634	CCEA1JH221E	CAP , ELECT	220UF 63V	1	EA
C635	CCEA1JH221E	CAP , ELECT	220UF 63V	1	EA
C636	CCEA1JH221E	CAP , ELECT	220UF 63V	1	EA
C637	CCEA1JH221E	CAP , ELECT	220UF 63V	1	EA

Ref. Designator	Part Number	Description		Qty	
MAIN PCB/HEATSINK		**(CUP12026)**			
C638	CCEA1JH221E	CAP , ELECT	220UF 63V	1	EA
C639	CCEA1JH221E	CAP , ELECT	220UF 63V	1	EA
C640	CCEA1JH221E	CAP , ELECT	220UF 63V	1	EA
C807	CCEA1JH221E	CAP , ELECT	220UF 63V	1	EA
C808	CCEA1JH221E	CAP , ELECT	220UF 63V	1	EA
C809	CCEA1JH221E	CAP , ELECT	220UF 63V	1	EA
C810	CCEA1JH221E	CAP , ELECT	220UF 63V	1	EA
C902	CCET63VKL5822NK	CAP , ELECT	8200/63V (30*50)	1	EA
C904	KCKDKS472ME	CAP , CERAMIC(X1/Y2/SC)	0.0047UF/2.5KV	1	EA
C906	CCEA1EH102E	CAP , ELECT	1000UF 25V	1	EA
C909	CCET63VKL5822NK	CAP , ELECT	8200/63V (30*50)	1	EA
C915	CCET63VKL5123NK	CAP , ELECT	12000/63V (35*45)	1	EA
C916	CCET63VKL5123NK	CAP , ELECT	12000/63V (35*45)	1	EA
Semiconductors					
D501	CVD1SS133MT	DIODE	1SS133	1	EA
D502	CVD1SS133MT	DIODE	1SS133	1	EA
D503	CVD1SS133MT	DIODE	1SS133	1	EA
D504	CVD1SS133MT	DIODE	1SS133	1	EA
D505	CVD1SS133MT	DIODE	1SS133	1	EA
D581	CVD1SS133MT	DIODE	1SS133	1	EA
D582	CVD1SS133MT	DIODE	1SS133	1	EA
D583	CVD1SS133MT	DIODE	1SS133	1	EA
D584	CVD1SS133MT	DIODE	1SS133	1	EA
D585	CVD1SS133MT	DIODE	1SS133	1	EA
D801	CVD1SS133MT	DIODE	1SS133	1	EA
D802	CVD1SS133MT	DIODE	1SS133	1	EA
D803	CVD1SS133MT	DIODE	1SS133	1	EA
D804	CVD1SS133MT	DIODE	1SS133	1	EA
D901	CVD1N4003SRT	DIODE , RECT	1N4003	1	EA
D902	CVD1SS133MT	DIODE	1SS133	1	EA
D911	CVD1SS133MT	DIODE	1SS133	1	EA
D912	CVD1SS133MT	DIODE	1SS133	1	EA
D914	CVD1SS133MT	DIODE	1SS133	1	EA
D917	CVD1SS133MT	DIODE	1SS133	1	EA
D953	CVD1SS133MT	DIODE	1SS133	1	EA
D954	CVD1N4003SRT	DIODE , RECT	1N4003	1	EA
D955	CVD1N4003SRT	DIODE , RECT	1N4003	1	EA
D956	CVD1N4003SRT	DIODE , RECT	1N4003	1	EA
D957	CVD1N4003SRT	DIODE , RECT	1N4003	1	EA
D961	CVD1N4003ST	DIODE , RECT	1N4003	1	EA
D962	CVD1N4003SRT	DIODE , RECT	1N4003	1	EA
D963	CVD1N4003SRT	DIODE , RECT	1N4003	1	EA
D964	CVD1SS133MT	DIODE	1SS133	1	EA
D967	CVD1SS133MT	DIODE	1SS133	1	EA
D968	CVD1SS133MT	DIODE	1SS133	1	EA
D969	CVD1SS133MT	DIODE	1SS133	1	EA
D971	CVD1SS133MT	DIODE	1SS133	1	EA
D972	CVD1SS133MT	DIODE	1SS133	1	EA
D973	CVD1SS133MT	DIODE	1SS133	1	EA
D974	CVD1SS133MT	DIODE	1SS133	1	EA
D975	CVD1SS133MT	DIODE	1SS133	1	EA
D976	CVD1SS133MT	DIODE	1SS133	1	EA
D979	CVDZJ5.1BT	DIODE , ZENER	ZJ5.1B 1/2W	1	EA
IC97	HVIRE5VT28CATZ	I.C , RESET	RESET	1	EA
Q501	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q502	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q503	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q504	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q505	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA

Ref. Designator	Part Number	Description		Qty	
MAIN PCB/HEATSINK		**(CUP12026)**			
Q511	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q512	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q513	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q514	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q515	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q516	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q517	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q518	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q519	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q520	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q541	HVTKTC3198YT	TRANSISTOR NPN	KTC3198Y	1	EA
Q542	HVTKTC3198YT	TRANSISTOR NPN	KTC3198Y	1	EA
Q543	HVTKTC3198YT	TRANSISTOR NPN	KTC3198Y	1	EA
Q544	HVTKTC3198YT	TRANSISTOR NPN	KTC3198Y	1	EA
Q545	HVTKTC3198YT	TRANSISTOR NPN	KTC3198Y	1	EA
Q556	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q557	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q558	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q559	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q560	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q561	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q562	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q563	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q564	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q565	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q601	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q602	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q603	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q604	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q605	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q681	HVTKSC2785YT	TRANSISTOR NPN	KSC2785Y	1	EA
Q682	HVTKSC2785YT	TRANSISTOR NPN	KSC2785Y	1	EA
Q683	HVTKSC2785YT	TRANSISTOR NPN	KSC2785Y	1	EA
Q684	HVTKSC2785YT	TRANSISTOR NPN	KSC2785Y	1	EA
Q685	HVTKSC2785YT	TRANSISTOR NPN	KSC2785Y	1	EA
Q801	HVTKSC2785YT	TRANSISTOR NPN	KSC2785Y	1	EA
Q802	HVTKSC2785YT	TRANSISTOR NPN	KSC2785Y	1	EA
Q812	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q813	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q814	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q815	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q816	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q817	HVTKTA1268GRT	TRANSISTOR PNP	KTA1268GR	1	EA
Q818	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q819	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q820	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q821	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q822	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q823	HVTKTC3200GRT	TRANSISTOR NPN	KTC3200GR	1	EA
Q824	HVTKTC3198YT	TRANSISTOR NPN	KTC3198Y	1	EA
Q825	HVTKTC3198YT	TRANSISTOR NPN	KTC3198Y	1	EA
Q901	HVTKSC2785YT	TRANSISTOR NPN	KSC2785Y	1	EA
Q911	HVTKTA1271YT	TRANSISTOR PNP	KTA1271Y	1	EA
Q912	HVTKTA1271YT	TRANSISTOR PNP	KTA1271Y	1	EA
Q913	HVTKTA1271YT	TRANSISTOR PNP	KTA1271Y	1	EA
Q914	HVTKTA1271YT	TRANSISTOR PNP	KTA1271Y	1	EA
Q915	HVTKSC2785YT	TRANSISTOR NPN	KSC2785Y	1	EA
Q916	HVTKSC2785YT	TRANSISTOR NPN	KSC2785Y	1	EA
Q917	HVTKSC2785YT	TRANSISTOR NPN	KSC2785Y	1	EA
Q918	HVTKSC2785YT	TRANSISTOR NPN	KSC2785Y	1	EA
Q938	HVTKRA107MT	TRANSISTOR PNP	KRA107M	1	EA

Ref. Designator	Part Number	Description		Qty	
MAIN PCB/HEATSINK		**(CUP12026)**			
Q939	HVTKRA107MT	TRANSISTOR PNP	KRA107M	1	EA
Q941	HVTKSC2785YT	TRANSISTOR NPN	KSC2785Y	1	EA
Q942	HVTKSC2785YT	TRANSISTOR NPN	KSC2785Y	1	EA
Q943	HVTKSC2785YT	TRANSISTOR NPN	KSC2785Y	1	EA
Q951	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
Q952	HVTKRA107MT	TRANSISTOR PNP	KRA107M	1	EA
Q960	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
Q961	HVTKTA1024YT	TRANSISTOR PNP	KTA1024YT	1	EA
Q991	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
Q992	HVTKRA107MT	TRANSISTOR PNP	KRA107M	1	EA
Q993	HVTKRA107MT	TRANSISTOR PNP	KRA107M	1	EA
Q994	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
Q997	HVTKRA107MT	TRANSISTOR PNP	KRA107M	1	EA
Q998	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
Q652	HVT2SB1647-OKM	TRANSISTOR , POWER, PNP	2SB1647	1	EA
Q653	HVT2SB1647-OKM	TRANSISTOR , POWER, PNP	2SB1647	1	EA
Q654	HVT2SB1647-OKM	TRANSISTOR , POWER, PNP	2SB1647	1	EA
Q655	HVT2SB1647-OKM	TRANSISTOR , POWER, PNP	2SB1647	1	EA
Q657	HVT2SD2560-OKM	TRANSISTOR , POWER, NPN	2SD2560	1	EA
Q658	HVT2SD2560-OKM	TRANSISTOR , POWER, NPN	2SD2560	1	EA
Q659	HVT2SD2560-OKM	TRANSISTOR , POWER, NPN	2SD2560	1	EA
Q660	HVT2SD2560-OKM	TRANSISTOR , POWER, NPN	2SD2560	1	EA
Q661	HVT2SB1647-OKM	TRANSISTOR , POWER, PNP	2SB1647	1	EA
Q670	HVT2SD2560-OKM	TRANSISTOR , POWER, NPN	2SD2560	1	EA
Q803	HVT2SD2560-OKM	TRANSISTOR , POWER, NPN	2SD2560	1	EA
Q804	HVT2SB1647-OKM	TRANSISTOR , POWER, PNP	2SB1647	1	EA
Q805	HVT2SD2560-OKM	TRANSISTOR , POWER, NPN	2SD2560	1	EA
Q807	HVT2SB1647-OKM	TRANSISTOR , POWER, PNP	2SB1647	1	EA
Q858	HVT2SA1360O	TRANSISTOR , POWER, PNP	2SA1360O	1	EA
Q871	HVT2SA1360O	TRANSISTOR , POWER, PNP	2SA1360O	1	EA
Q872	HVT2SA1360O	TRANSISTOR , POWER, PNP	2SA1360O	1	EA
Q874	HVT2SA1360O	TRANSISTOR , POWER, PNP	2SA1360O	1	EA
Q875	HVT2SA1360O	TRANSISTOR , POWER, PNP	2SA1360O	1	EA
Q876	HVT2SA1360O	TRANSISTOR , POWER, PNP	2SA1360O	1	EA
Q877	HVT2SA1360O	TRANSISTOR , POWER, PNP	2SA1360O	1	EA
Q881	HVT2SC3423O	TRANSISTOR , POWER, NPN	2SC3423O	1	EA
Q882	HVT2SC3423O	TRANSISTOR , POWER, NPN	2SC3423O	1	EA
Q883	HVT2SC3423O	TRANSISTOR , POWER, NPN	2SC3423O	1	EA
Q884	HVT2SC3423O	TRANSISTOR , POWER, NPN	2SC3423O	1	EA
Q885	HVT2SC3423O	TRANSISTOR , POWER, NPN	2SC3423O	1	EA
Q886	HVT2SC3423O	TRANSISTOR , POWER, NPN	2SC3423O	1	EA
Q887	HVT2SC3423O	TRANSISTOR , POWER, NPN	2SC3423O	1	EA
Resistors					
R501	CRD20TJ433T	RES , CARBON	43K OHM 1/5W J	1	EA
R502	CRD20TJ433T	RES , CARBON	43K OHM 1/5W J	1	EA
R503	CRD20TJ433T	RES , CARBON	43K OHM 1/5W J	1	EA
R504	CRD20TJ433T	RES , CARBON	43K OHM 1/5W J	1	EA
R505	CRD20TJ433T	RES , CARBON	43K OHM 1/5W J	1	EA
R506	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1	EA
R507	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1	EA
R508	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1	EA
R509	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1	EA
R510	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1	EA
R511	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R512	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R513	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R514	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R515	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R516	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA

Ref. Designator	Part Number	Description		Qty	
MAIN PCB/HEATSINK		**(CUP12026)**			
R517	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R518	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R519	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R520	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R521	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1	EA
R522	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1	EA
R523	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1	EA
R524	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1	EA
R525	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1	EA
R531	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R532	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R533	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R534	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R535	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R536	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R537	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R538	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R539	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R540	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R541	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1	EA
R542	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1	EA
R543	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1	EA
R544	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1	EA
R545	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1	EA
R556	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1	EA
R557	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1	EA
R558	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1	EA
R559	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1	EA
R560	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1	EA
R561	CRD20TJ162T	RES , CARBON	1.6K OHM 1/5W J	1	EA
R562	CRD20TJ162T	RES , CARBON	1.6K OHM 1/5W J	1	EA
R563	CRD20TJ162T	RES , CARBON	1.6K OHM 1/5W J	1	EA
R564	CRD20TJ162T	RES , CARBON	1.6K OHM 1/5W J	1	EA
R565	CRD20TJ162T	RES , CARBON	1.6K OHM 1/5W J	1	EA
R566	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R567	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R568	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R569	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R570	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R571	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R572	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R573	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R574	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R575	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R576	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R577	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R578	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R579	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R580	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R581	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R582	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R583	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R584	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R585	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R586	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R587	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R588	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R589	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R590	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R591	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R592	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA

Ref. Designator	Part Number	Description		Qty	
MAIN PCB/HEATSINK		**(CUP12026)**			
R593	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R594	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R595	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R596	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R597	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R598	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R599	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R600	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R601	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R602	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R603	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R604	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R605	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R606	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R607	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R608	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R609	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R610	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R611	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R612	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R631	CRD25FJ180T	RES , CARBON	18 OHM 1/5W J	1	EA
R632	CRD25FJ180T	RES , CARBON	18 OHM 1/5W J	1	EA
R633	CRD25FJ180T	RES , CARBON	18 OHM 1/5W J	1	EA
R634	CRD25FJ180T	RES , CARBON	18 OHM 1/5W J	1	EA
R635	CRD25FJ180T	RES , CARBON	18 OHM 1/5W J	1	EA
R636	CRD25FJ180T	RES , CARBON	18 OHM 1/5W J	1	EA
R637	CRD25FJ180T	RES , CARBON	18 OHM 1/5W J	1	EA
R638	CRD25FJ180T	RES , CARBON	18 OHM 1/5W J	1	EA
R639	CRD25FJ180T	RES , CARBON	18 OHM 1/5W J	1	EA
R640	CRD25FJ180T	RES , CARBON	18 OHM 1/5W J	1	EA
R646	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R647	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R648	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R649	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R650	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R651	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R652	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R653	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R654	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R655	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R666	CRD25TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R667	CRD25TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R668	CRD25TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R669	CRD25TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R670	CRD25TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R671	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R672	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R673	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R674	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R675	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R676	CRD25TJ182T	RES , CARBON	1.8K OHM 1/5W J	1	EA
R677	CRD25TJ182T	RES , CARBON	1.8K OHM 1/5W J	1	EA
R678	CRD25TJ182T	RES , CARBON	1.8K OHM 1/5W J	1	EA
R679	CRD25TJ182T	RES , CARBON	1.8K OHM 1/5W J	1	EA
R680	CRD25TJ182T	RES , CARBON	1.8K OHM 1/5W J	1	EA
R681	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1	EA
R682	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1	EA
R683	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1	EA
R684	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1	EA
R685	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1	EA
R686	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA

Ref. Designator	Part Number	Description		Qty	
MAIN PCB/HEATSINK		**(CUP12026)**			
R687	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R688	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R689	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R690	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R696	CRD25TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R697	CRD25TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R698	CRD25TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R699	CRD25TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R700	CRD25TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R701		WIRE , COPPER	SN95/PB5 , 0.6	1	EA
R702		WIRE , COPPER	SN95/PB5 , 0.6	1	EA
R703		WIRE , COPPER	SN95/PB5 , 0.6	1	EA
R704		WIRE , COPPER	SN95/PB5 , 0.6	1	EA
R705		WIRE , COPPER	SN95/PB5 , 0.6	1	EA
R706		WIRE , COPPER	SN95/PB5 , 0.6	1	EA
R707		WIRE , COPPER	SN95/PB5 , 0.6	1	EA
R708		WIRE , COPPER	SN95/PB5 , 0.6	1	EA
R771	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R772	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R773	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R774	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R775	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R776	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R777	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R781	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R782	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R783	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R784	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R785	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R786	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R787	CRD20TJ750T	RES , CARBON	75 OHM 1/5W J	1	EA
R801	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R802	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R803	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1	EA
R804	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1	EA
R805	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R807	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R808	CRD25TJ182T	RES , CARBON	1.8K OHM 1/5W J	1	EA
R809	CRD25TJ182T	RES , CARBON	1.8K OHM 1/5W J	1	EA
R812	CRD25TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R813	CRD25TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R814	CRD25TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R815	CRD25TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R817	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R818	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R819	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R820	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R821	CRD25FJ180T	RES , CARBON	18 OHM 1/5W J	1	EA
R822	CRD25FJ180T	RES , CARBON	18 OHM 1/5W J	1	EA
R823	CRD25FJ180T	RES , CARBON	18 OHM 1/5W J	1	EA
R824	CRD25FJ180T	RES , CARBON	18 OHM 1/5W J	1	EA
R830	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R831	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R832	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R833	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R834	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R835	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R836	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R837	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R838	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R839	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA

Ref. Designator	Part Number	Description		Qty	
MAIN PCB/HEATSINK		**(CUP12026)**			
R840	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R841	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R842	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R843	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R844	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R845	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R848	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1	EA
R849	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1	EA
R850	CRD20TJ162T	RES , CARBON	1.6K OHM 1/5W J	1	EA
R851	CRD20TJ162T	RES , CARBON	1.6K OHM 1/5W J	1	EA
R852	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R853	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R854	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R855	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R856	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R857	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R858	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R859	CRD20TJ221T	RES , CARBON	220 OHM 1/5W J	1	EA
R860	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1	EA
R861	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1	EA
R862	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1	EA
R863	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1	EA
R870	CRD20TJ433T	RES , CARBON	43K OHM 1/5W J	1	EA
R871	CRD20TJ433T	RES , CARBON	43K OHM 1/5W J	1	EA
R872	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1	EA
R873	CRD20TJ471T	RES , CARBON	470 OHM 1/5W J	1	EA
R900	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R901	CRD25TJ393T	RES , CARBON	39K OHM 1/5W J	1	EA
R902	CRD25TJ393T	RES , CARBON	39K OHM 1/5W J	1	EA
R903	CRD25TJ393T	RES , CARBON	39K OHM 1/5W J	1	EA
R906	CRD25TJ393T	RES , CARBON	39K OHM 1/5W J	1	EA
R907	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R908	CRD20TJ105T	RES , CARBON	1M OHM 1/5W J	1	EA
R909	CRD20TJ682T	RES , CARBON	6.8K OHM 1/5W J	1	EA
R910	CRD20TJ105T	RES , CARBON	1M OHM 1/5W J	1	EA
R912	CRD20TJ332T	RES , CARBON	3.3K OHM 1/5W J	1	EA
R913		WIRE , COPPER	SN95/PB5 , 0.6	1	EA
R917	CRD25TJ393T	RES , CARBON	39K OHM 1/5W J	1	EA
R918	CRD25TJ393T	RES , CARBON	39K OHM 1/5W J	1	EA
R919	CRD25TJ393T	RES , CARBON	39K OHM 1/5W J	1	EA
R920	CRD25TJ393T	RES , CARBON	39K OHM 1/5W J	1	EA
R921	CRD25FJ180T	RES , CARBON	18 OHM 1/5W J	1	EA
R923	CRD20TJ220T	RES , CARBON	22 OHM 1/5W J	1	EA
R924	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	1	EA
R925	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	1	EA
R926	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	1	EA
R927	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	1	EA
R928	CRD20TJ222T	RES , CARBON	2.2K OHM 1/5W J	1	EA
R929	CRD20TJ222T	RES , CARBON	2.2K OHM 1/5W J	1	EA
R930	CRD20TJ222T	RES , CARBON	2.2K OHM 1/5W J	1	EA
R931	CRD20TJ222T	RES , CARBON	2.2K OHM 1/5W J	1	EA
R932	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R933	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R934	CRD20TJ823T	RES , CARBON	82K OHM 1/5W J	1	EA
R935	CRD20TJ154T	RES , CARBON	150K OHM 1/5W J	1	EA
R936	CRD20TJ184T	RES , CARBON	180K OHM 1/5W J	1	EA
R939	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R940	CRD20TJ152T	RES , CARBON	1.5K OHM 1/5W J	1	EA
R941	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R942	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R943	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA

Ref. Designator	Part Number	Description		Qty	
MAIN PCB/HEATSINK		**(CUP12026)**			
R944	CRD25TJ223T	RES , CARBON	22K OHM 1/4W J	1	EA
R945	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R946	CRD25TJ223T	RES , CARBON	22K OHM 1/4W J	1	EA
R947	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R948	CRD25TJ153T	RES , CARBON	15K OHM 1/5W J	1	EA
R952	CRD25TJ223T	RES , CARBON	22K OHM 1/4W J	1	EA
R953	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R954	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R955	CRD20TJ203T	RES , CARBON	20K OHM 1/5W J	1	EA
R956	CRD20TJ394T	RES , CARBON	390K OHM 1/5W J	1	EA
R957	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1	EA
R958	CRD20TJ563T	RES , CARBON	56K OHM 1/5W J	1	EA
R959	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R960	CRD20TJ332T	RES , CARBON	3.3K OHM 1/5W J	1	EA
R961	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1	EA
R962	CRD20TJ273T	RES , CARBON	27K OHM 1/5W J	1	EA
R963	CRD20TJ105T	RES , CARBON	1M OHM 1/5W J	1	EA
R964	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R965	CRD20TJ223T	RES , CARBON	22K OHM 1/5W J	1	EA
R966	CRD20TJ472T	RES , CARBON	4.7K OHM 1/5W J	1	EA
R967	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1	EA
R968	CRD20TJ105T	RES , CARBON	1M OHM 1/5W J	1	EA
R969	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R986	CRD20TJ102T	RES , CARBON	1K OHM 1/5W J	1	EA
R987	CRD20TJ561T	RES , CARBON	560 OHM 1/5W J	1	EA
R988	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1	EA
R989	CRD20TJ302T	RES , CARBON	3K OHM 1/5W J	1	EA
R991	CRD20TJ822T	RES , CARBON	8.2K OHM 1/5W J	1	EA
R992	CRD20TJ562T	RES , CARBON	5.6K OHM 1/5W J	1	EA
R998	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R656	CRF5EKR27HX2K	RES , CEMENT	0.27ohm X 2	1	EA
R657	CRF5EKR27HX2K	RES , CEMENT	0.27ohm X 2	1	EA
R658	CRF5EKR27HX2K	RES , CEMENT	0.27ohm X 2	1	EA
R659	CRF5EKR27HX2K	RES , CEMENT	0.27ohm X 2	1	EA
R660	CRF5EKR27HX2K	RES , CEMENT	0.27ohm X 2	1	EA
R810	CRF5EKR27HX2K	RES , CEMENT	0.27ohm X 2	1	EA
R811	CRF5EKR27HX2K	RES , CEMENT	0.27ohm X 2	1	EA
R905	CRG1ANJ1R0H	RES , METAL OXIDE FILM	1 OHM 1W J	1	EA
R911	CRG1ANJ271H	RES , METAL OXIDE(270/1W)	270 OHM 1W J	1	EA
R922	CRG1ANJ680H	RES , METAL OXIDE FILM	68 OHM 1W J	1	EA
R990	CRG1ANJ100H	RES , METAL OXIDE FILM	10 OHM 1W J	1	EA
R993	CRG1ANJ100H	RES , METAL OXIDE FILM	10 OHM 1W J	1	EA
R994	CRG1ANJ100H	RES , METAL OXIDE FILM	10 OHM 1W J	1	EA
R995	CRG1ANJ100H	RES , METAL OXIDE FILM	10 OHM 1W J	1	EA
R996	CRG1ANJ100H	RES , METAL OXIDE FILM	10 OHM 1W J	1	EA
R997	CRG1ANJ100H	RES , METAL OXIDE FILM	10 OHM 1W J	1	EA
R999	CRG1ANJ100H	RES , METAL OXIDE FILM	10 OHM 1W J	1	EA
Miscellaneous					
ET90	HJT1A025	PLATE , EARTH	MET37-0002	1	EA
ET91	HJT1A025	PLATE , EARTH	MET37-0002	1	EA
F901	KJCFC5S	HOLDER , FUSE	HOLDER	2	EA
F902	KBA2D2500TLET	FUSE(SR-5,2.5A,250V)	SAVE FUSETECH	1	EA
	CMYAVR355	HEAT SINK ASS'Y	ASS'Y	1	EA
	CFNCF12825HSN	FAN , MOTOR	FAN	2	EA
	CHD1A012R	SCREW , SPECIAL	SCREW	21	EA
	CHD1A036R	SCREW , SPECIAL	SCREW	6	EA
	CHD3A012R	SCREW , SPECIAL	SCREW	5	EA
	CHG1A412	CUSHION	CUSHION	1	EA
	CMD1A398	BRACKET , PCB	BRACKET	2	EA

Ref. Designator	Part Number	Description		Qty	
MAIN PCB/HEATSINK		**(CUP12026)**			
	CMD1A417	BRACKET , PCB	BRACKET	2	EA
	CMD1A600	BRACKET , FAN	BRACKET	1	EA
	CMD2A615	BRACKET , FAN	BRACKET	1	EA
	CMY1A303	HEAT SINK	HEAT SINK	1	EA
	CMY2A249	HEAT SINK	HEAT SINK	1	EA
	CTB3+10JR	SCREW	SCREW	3	EA
	CTB3+8JR	SCREW	SCREW	7	EA
	CTW3+8JR	SCREW	SCREW	1	EA
	CTW3+8JR	SCREW	SCREW	2	EA
	CWE8202150AA	WIRE ASS'Y	WIRE	1	EA
BN19	CWB3FE03250UP	WIRE ASS'Y	WIRE	1	EA
BN20	CWB3FC04280UP	WIRE ASS'Y	WIRE	1	EA
BN81	CWB1C902050EN	WIRE ASS'Y	WIRE	1	EA
BN82	CWB1C902050EN	WIRE ASS'Y	WIRE	1	EA
BN83	CWB1C902050EN	WIRE ASS'Y	WIRE	1	EA
BN84	CWB1C902050EN	WIRE ASS'Y	WIRE	1	EA
BN85	CWB1C902050EN	WIRE ASS'Y	WIRE	1	EA
BN86	CWB1C902050EN	WIRE ASS'Y	WIRE	1	EA
BN87	CWB1C902050EN	WIRE ASS'Y	WIRE	1	EA
BN88	CWB2B905080EN	WIRE ASS'Y	WIRE	1	EA
BN90	CWB4F232550PU	WIRE ASS'Y	WIRE	1	EA
BN98	HJP08GA130ZK	WAFER	WAFER	1	EA
BN99	CWB1C902250BM	WIRE ASS'Y	WIRE	1	EA
CN11	CJP17GA117ZY	WAFER	WAFER	1	EA
CN12	CJP21GA115ZY	WAFER , CARD CABLE	WAFER	1	EA
CN61	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN	WAFER	1	EA
CN62	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN	WAFER	1	EA
CN63	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN	WAFER	1	EA
CN64	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN	WAFER	1	EA
CN65	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN	WAFER	1	EA
CN66	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN	WAFER	1	EA
CN67	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN	WAFER	1	EA
CN89	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN	WAFER	1	EA
CN91	CJP02GA89ZY	WAFER	WAFER	1	EA
CN92	CJP02KA060ZY	WAFER	WAFER	1	EA
CN93	CJP02GA01ZY	WAFER , STRAIGHT, 2PIN	WAFER	1	EA
ET01	CMD1A387	BRACKET , PCB	PCB	1	EA
JK91	CJJ5R006Z	TERMINAL , SPEAKER	TERMINAL	1	EA
JK92	CJJ5Q012Z	TERMINAL , SPEAKER	TERMINAL	1	EA
JK97	CJJ4P041W	JACK IN/OUT	JACK	1	EA
JK98	CJJ4P042W	JACK IN/OUT	JACK	1	EA
JW90	CWE8212120VV	WIRE , RED	WIRE	1	EA
JW91	CWE8212180VV	WIRE ASS'Y	WIRE	1	EA
JW93	CWEE202110VV	WIRE (BLACK)	WIRE	1	EA
L501	CLEY0R5KAK	COIL , SPEAKER	0.5UH K	1	EA
L502	CLEY0R5KAK	COIL , SPEAKER	0.5UH K	1	EA
L503	CLEY0R5KAK	COIL , SPEAKER	0.5UH K	1	EA
L504	CLEY0R5KAK	COIL , SPEAKER	0.5UH K	1	EA
L505	CLEY0R5KAK	COIL , SPEAKER	0.5UH K	1	EA
L506	CLEY0R5KAK	COIL , SPEAKER	0.5UH K	1	EA
L507	CLEY0R5KAK	COIL , SPEAKER	0.5UH K	1	EA
OL91	KJJ7A013Z	OUTLET , AC 1 PIN USA	A202D0031P(1P)	1	EA
RY94	CSL1E002ZE	RELAY , POWER	G5PA-1 (DC 6V)	1	EA
TH91	KRTP42T7D330B	THERMAL SENSOR , POSISTOR	P42T7D330BW20	1	EA
T902	CLT5I009ZU	TRANS , SUB C515	TRANS	1	EA
PCB , POWER TRANS/DOWNLOAD/DIG IN/OUT		**CUP12101**			
Capacitors					
C104	CCBS1E103ZFT	CAP , CERAMIC	0.01UF 25V	1	EA

Ref. Designator	Part Number	Description		Qty	
PCB , POWER TRANS/DOWNLOAD/DIG IN/OUT CUP12101					
C105	CCBS1E103ZFT	CAP , CERAMIC	0.01UF 25V	1	EA
C106	CCFT1H104ZF	CAP , SEMICONDUCTOR	0.1UF 50V Z	1	EA
C107	CCBS1E103ZFT	CAP , CERAMIC	0.01UF 25V	1	EA
C108	CCBS1E103ZFT	CAP , CERAMIC	0.01UF 25V	1	EA
C109	CCFT1H104ZF	CAP , SEMICONDUCTOR	0.1UF 50V Z	1	EA
C117	CCEA1HH4R7T	CAP , ELECT	4.7UF 50V	1	EA
C118	CCBS1E103ZFT	CAP , CERAMIC	0.01UF 25V	1	EA
C119	CCEA1JH470TS	CAP , ELECT	63V/47UF/105'C	1	EA
C120	CCEA1JH470TS	CAP , ELECT	63V/47UF/105'C	1	EA
C121	CCBS1E103ZFT	CAP , CERAMIC	0.01UF 25V	1	EA
C126	CCFT1H473ZF	CAP , CERAMIC	0.047UF 50V Z	1	EA
C127	CCFT1H473ZF	CAP , CERAMIC	0.047UF 50V Z	1	EA
C131	CCEA1HH3R3T	CAP , ELECT	3.3UF 50V	1	EA
C750	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C751	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C752	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C851	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C852	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C853	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C854	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C855	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C856	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C857	CCEA1HH100T	CAP , ELECT	10UF 50V	1	EA
C911	CCEA1HKS2R2T	CAP , ELECT	2.2UF 50V SMALL SIZE	1	EA
C912	CCEA0JH102T	CAP , ELECT	1000UF 6.3V	1	EA
C919	CCKT1H102KB	CAP , CERAMIC	1000PF 50V K	1	EA
C920	CCEA1HH470T	CAP , ELECT	47UF 50V	1	EA
C921	HCQI1H104JZT	CAP , MYLAR	0.1UF 50V J	1	EA
C922	HCQI1H104JZT	CAP , MYLAR	0.1UF 50V J	1	EA
C923	HCQI1H104JZT	CAP , MYLAR	0.1UF 50V J	1	EA
C924	HCQI1H104JZT	CAP , MYLAR	0.1UF 50V J	1	EA
C925	HCQI1H103JZT	CAP , MYLAR	0.01UF 50V J	1	EA
C926	HCQI1H103JZT	CAP , MYLAR	0.01UF 50V J	1	EA
C927	HCQI1H103JZT	CAP , MYLAR	0.01UF 50V J	1	EA
C928	HCQI1H103JZT	CAP , MYLAR	0.01UF 50V J	1	EA
C931	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C932	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C933	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C934	HCQI1H473JZT	CAP , MYLAR	0.047UF 50V J	1	EA
C935	CCBS1H223ZFT	CAP , CERAMIC	0.022UF 50V	1	EA
C936	CCBS1H223ZFT	CAP , CERAMIC	0.022UF 50V	1	EA
C937	CCBS1H223ZFT	CAP , CERAMIC	0.022UF 50V	1	EA
C938	CCEA1CH101T	CAP , ELECT	100UF 16V	1	EA
C939	CCEA1EH101T	CAP , ELECT	100UF 25V	1	EA
C940	CCEA1EH101T	CAP , ELECT	100UF 25V	1	EA
C953	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C954	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C957	CCBS1H104ZFT	CAP , CERAMIC	0.1UF 50V Z	1	EA
C971	CCFT1H104ZF	CAP , SEMICONDUCTOR	0.1UF 50V Z	1	EA
C122	CCEA1JH101E	CAP , ELECT	100UF 63V	1	EA
C129	CCEA1EH822E	CAP , ELECT(KR3, 8200UF/25V, 18X30)	8200UF 25V	1	EA
C130	CCEA1EH102E	CAP , ELECT	2200UF 35V	1	EA
C929	CCEA1VH222EZ	CAP , ELECT (2200UF/35V, 12.5X31)	2200UF 35V	1	EA
C930	CCEA1VH222EZ	CAP , ELECT (2200UF/35V, 12.5X31)	6800UF 24V	1	EA
C941	CCEA1EH682E	CAP , ELECT(KR3, 25V/6800, 18X35.5)	1000UF 50V	1	EA
Semiconductors					
D101	CVDZJ15BT	DIODE , ZENER	ZJ15B 1/2W	1	EA
D102	HVDMTZJ27BT	DIODE , ZENER	MTZJ27B 1/2W	1	EA
D104	CVD1N4003ST	DIODE , RECT	1N4003	1	EA

Ref. Designator	Part Number	Description		Qty	
PCB , POWER TRANS/DOWNLOAD/DIG IN/OUT CUP12101					
D105	CVD1N4003ST	DIODE , RECT	1N4003	1	EA
D108	CVD1N4003ST	DIODE , RECT	1N4003	1	EA
D109	CVDZJ8.2BT	DIODE , ZENER	ZJ8.2B 1/2W	1	EA
D111	CVDZJ8.2BT	DIODE , ZENER	ZJ8.2B 1/2W	1	EA
D114	CVD1N4003ST	DIODE , RECT	1N4003	1	EA
D115	CVD1N4003ST	DIODE , RECT	1N4003	1	EA
D116	CVD1N4003ST	DIODE , RECT	1N4003	1	EA
D117	CVD1N4003ST	DIODE , RECT	1N4003	1	EA
D120	CVD1N4003ST	DIODE , RECT	1N4003	1	EA
D121	CVD1N4003ST	DIODE , RECT	1N4003	1	EA
D124	CVD1N4003ST	DIODE , RECT	1N4003	1	EA
D125	CVD1N4003ST	DIODE , RECT	1N4003	1	EA
D201	CVDZJ3.3BT	DIODE , ZENER	ZJ3.3B 1/2W	1	EA
D801	CVD1SS133MT	DIODE	1SS133	1	EA
D802	CVD1SS133MT	DIODE	1SS133	1	EA
D921	CVD1SS133MT	DIODE	1SS133	1	EA
Q104	HVTKSC2316YT	TRANSISTOR NPN	KSC2316Y	1	EA
Q911	HVTKTA1267YT	TRANSISTOR PNP	KTA1267Y	1	EA
Q912	HVTKTC3198YT	TRANSISTOR NPN	KTC3198Y	1	EA
Q913	HVTKTC3198YT	TRANSISTOR NPN	KTC3198Y	1	EA
Q995	HVTKRA107MT	TRANSISTOR PNP	KRA107M	1	EA
Q997	HVTKRC107MT	TRANSISTOR NPN	KRC107M	1	EA
IC81	CVIST232CDR	IC , RS232C(SO-16TYPE)	ST(ST232CDR)	1	EA
IC89	HVIKIA278R05PI	REGULATOR (5V OUTPUT LOW DROP)	KEC(KIA278R05PI)	1	EA
IC90	CVIKIA278R15PI	I.C , REGULATOR(15V OUTPUT LOW DRO	KEC(KIA278R15PI)	1	EA
IC91	CVIKIA7915PI	I.C , REGULATOR(15V, TO-220AB)	KEC(KIA7915PI)	1	EA
IC97	BVIKP1010B	IC, PHOTO COUPLER	COSMO(KP1010B)	1	EA
IC98	BVIKP1010B	IC, PHOTO COUPLER	COSMO(KP1010B)	1	EA
IC99	HVI74LCX32TTR	I.C , OR-GATE	ST(74LCX32TTR)	1	EA
D701	HVDKBU804F	DIODE , BRIDGE	DIODE	1	EA
D991	CVDKBU804FMA	BRIDGE DIODE ASS'Y	ASS'Y	1	EA
	HVDKBU804F	DIODE , BRIDGE	DIODE	1	EA
D992	CVDKBU804FMA	BRIDGE DIODE ASS'Y	ASS'Y	1	EA
	HVDKBU804F	DIODE , BRIDGE	DIODE	1	EA
Q851	HVTKTD600KGR	TRANSISTOR , BIAS NPN	KTD600KGR	1	EA
Q852	HVTKTD600KGR	TRANSISTOR , BIAS NPN	KTD600KGR	1	EA
Q853	HVTKTD600KGR	TRANSISTOR , BIAS NPN	KTD600KGR	1	EA
Q854	HVTKTD600KGR	TRANSISTOR , BIAS NPN	KTD600KGR	1	EA
Q855	HVTKTD600KGR	TRANSISTOR , BIAS NPN	KTD600KGR	1	EA
Q856	HVTKTD600KGR	TRANSISTOR , BIAS NPN	KTD600KGR	1	EA
Q857	HVTKTD600KGR	TRANSISTOR , BIAS NPN	KTD600KGR	1	EA
Resistors					
R101	CRD25FJ3R3T	RES , CARBON	3.3 OHM 1/4W J	1	EA
R108	CRD20TJ8R2T	RES , CARBON	8.2 OHM 1/5W J	1	EA
R109	CRD20TJ100T	RES , CARBON	10 OHM 1/5W J	1	EA
R110	CRD20TJ8R2T	RES , CARBON	8.2 OHM 1/5W J	1	EA
R112	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1	EA
R113	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	1	EA
R120	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R121	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R122	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R750	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R751	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R752	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R874	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1	EA
R875	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1	EA
R876	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1	EA
R877	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1	EA
R878	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1	EA

Ref. Designator	Part Number	Description		Qty	
PCB , POWER TRANS/DOWNLOAD/DIG IN/OUT		**CUP12101**			
R879	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1	EA
R880	CRD20TJ331T	RES , CARBON	330 OHM 1/5W J	1	EA
R882	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1	EA
R883	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1	EA
R884	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1	EA
R885	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1	EA
R886	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1	EA
R887	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1	EA
R888	CRD20TJ122T	RES , CARBON	1.2K OHM 1/5W J	1	EA
R891	CRD20TJ391T	RES , CARBON	390 OHM 1/5W J	1	EA
R892	CRD20TJ391T	RES , CARBON	390 OHM 1/5W J	1	EA
R893	CRD20TJ391T	RES , CARBON	390 OHM 1/5W J	1	EA
R894	CRD20TJ391T	RES , CARBON	390 OHM 1/5W J	1	EA
R895	CRD20TJ391T	RES , CARBON	390 OHM 1/5W J	1	EA
R896	CRD20TJ391T	RES , CARBON	390 OHM 1/5W J	1	EA
R897	CRD20TJ391T	RES , CARBON	390 OHM 1/5W J	1	EA
R901	CRD20TJ272T	RES , CARBON	2.7K OHM 1/5W J	1	EA
R912	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1	EA
R913	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1	EA
R917	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1	EA
R918	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1	EA
R919	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1	EA
R920	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1	EA
R921	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1	EA
R922	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1	EA
R923	CRD25TJ153T	RES , CARBON	15K OHM 1/4W J	1	EA
R924	CRD20TJ153T	RES , CARBON	15K OHM 1/5W J	1	EA
R925	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R926	CRD25TJ103T	RES , CARBON	10K OHM 1/4W J	1	EA
R927	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R928	CRD20TJ333T	RES , CARBON	33K OHM 1/5W J	1	EA
R941	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R942	CRD20TJ104T	RES , CARBON	100K OHM 1/5W J	1	EA
R956	CRD20TJ1R0T	RES , CARBON	1 OHM 1/5W J	1	EA
R957	CRD20TJ101T	RES , CARBON	100 OHM 1/5W J	1	EA
R970	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R971	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
R972	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	1	EA
R973	CRD20TJ473T	RES , CARBON	47K OHM 1/5W J	1	EA
R974	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1	EA
R975	CRD20TJ271T	RES , CARBON	270 OHM 1/5W J	1	EA
R976	CRD20TJ470T	RES , CARBON	47 OHM 1/5W J	1	EA
R977	CRD20TJ103T	RES , CARBON	10K OHM 1/5W J	1	EA
VR81	CVN1RA221B02T	RES , SEMI FIXED (220, B CURVE)	KVSF637AVC	1	EA
VR82	CVN1RA221B02T	RES , SEMI FIXED (220, B CURVE)	KVSF637AVC	1	EA
VR83	CVN1RA221B02T	RES , SEMI FIXED (220, B CURVE)	KVSF637AVC	1	EA
VR84	CVN1RA221B02T	RES , SEMI FIXED (220, B CURVE)	KVSF637AVC	1	EA
VR85	CVN1RA221B02T	RES , SEMI FIXED (220, B CURVE)	KVSF637AVC	1	EA
VR86	CVN1RA221B02T	RES , SEMI FIXED (220, B CURVE)	KVSF637AVC	1	EA
VR87	CVN1RA221B02T	RES , SEMI FIXED (220, B CURVE)	KVSF637AVC	1	EA
R104	KRQ1AJR47H	RES , FUSE	0.47 OHM 1W J	1	EA
R105	KRQ1AJR47H	RES , FUSE	0.47 OHM 1W J	1	EA
R106	CRQ1AJR33H	RES , FUSE	0.33 OHM 1W J	1	EA
R107	CRQ1AJR33H	RES , FUSE	0.33 OHM 1W J	1	EA
Miscellaneous					
BN17	CJP06GB143ZB	FEMALE HEADER(6P, 2.54mm)	HEADER	1	EA
BN20	CWB1C905180BM	WIRE ASS'Y	WIRE	1	EA
BN21	CWB1C905120EN	WIRE ASS'Y	WIRE	1	EA
BN79	CWB1C907120EN	WIRE ASS'Y(7P, 2MM, 120MM)	WIRE	1	EA

Ref. Designator	Part Number	Description		Qty	
PCB , POWER TRANS/DOWNLOAD/DIG IN/OUT		**CUP12101**			
BN80	CWB2B903180EN	WIRE ASS'Y	WIRE	1	EA
BN96	CWB1C915180EN	WIRE ASS'Y(15P, 2MM, 180MM)	WIRE	1	EA
BN97	CWB1C907120EN	WIRE ASS'Y(7P, 2MM, 120MM)	WIRE	1	EA
CN13	CJP05GA01ZY	WAFER(YMW025-05R)	WIRE	1	EA
CN19	CJP03GA90ZY	WAFER	WAFER	1	EA
CN20	CJP04GA90ZM	WAFER	WAFER	1	EA
CN31	CJP02GA19ZY	WAFER , 2PIN	WAFER	1	EA
CN32	CJP02GA19ZY	WAFER , 2PIN	WAFER	1	EA
CN33	CJP02GA19ZY	WAFER , 2PIN	WAFER	1	EA
CN34	CJP02GA19ZY	WAFER , 2PIN	WAFER	1	EA
CN35	CJP02GA19ZY	WAFER , 2PIN	WAFER	1	EA
CN36	CJP02GA19ZY	WAFER , 2PIN	WAFER	1	EA
CN37	CJP02GA19ZY	WAFER , 2PIN	WAFER	1	EA
CN47	CJP07GA117ZY	WAFER	WAFER	1	EA
CN79	CJP07GA19ZY	WAFER , STRAIGHT(7PIN)	WAFER	1	EA
CN81	CJP07GA01ZY	WAFER , STRAIGHT(7PIN)	WAFER	1	EA
CN88	CJP05GA19ZY	WAFER , STRAIGHT	WAFER	1	EA
CN96	CJP15GA19ZY	WAFER	WAFER	1	EA
CN98	HJP08GB131ZK	WAFER	WAFER	1	EA
	CMY1A219	HEAT SINK (BRIDGE DIODE)	HEAT SINK	1	EA
	CTB3+12JR	SCREW	SCREW	1	EA
	CMD1A618	BRACKET , RESET	BRACKET	1	EA
	CMY1A219	HEAT SINK (BRIDGE DIODE)	HEAT SINK	1	EA
	CTB3+12JR	SCREW	SCREW	1	EA
JK75	HJSTORX177L	MODULE , OPTICAL(RX)	TORX177L	1	EA
JK76	HJSTORX177L	MODULE , OPTICAL(RX)	TORX177L	1	EA
JK77	HJSTORX177L	MODULE , OPTICAL(RX)	TORX177L	1	EA
JK94	CJJ2D008Z	JACK , STEREO	JACK	1	EA
JK95	CJJ2D008Z	JACK , STEREO	JACK	1	EA
JK96	CJJ2D008Z	JACK , STEREO	JACK	1	EA
JK97	CJJ9W001Z	JACK , 9P D-SUB FEMALE(RS-232C, SEMO	JACK	1	EA
JK99	CJJ2D008Z	JACK , STEREO	JACK	1	EA
ET04	CMD1A569	BRACKET , PCB	BRACKET	1	EA
ET05	CMD1A569	BRACKET , PCB	BRACKET	1	EA
F110	KBA2D2500TLET	FUSE(SR-5,2.5A,250V)	SAVE FUSETECH	1	EA
F111	KBA2D2500TLET	FUSE(SR-5,2.5A,250V)	SAVE FUSETECH	1	EA
SW95	CST1A010Z	SW , TACT	TACT SWITCH	1	EA
SW96	HSH2B018Z	SW , PUSH	SPUJ19XSM011	1	EA
SW97	HSH2B018Z	SW , PUSH	SPUJ19XSM011	1	EA
PCB , INPUT		**CUP12028**			
Capacitors					
C201	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C202	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C203	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C204	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C205	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C206	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C209	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C210	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C211	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C212	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C213	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C214	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C215	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C216	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C219	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C220	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C221	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA

Ref. Designator	Part Number	Description		Qty	
PCB , INPUT		**CUP12028**			
C222	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C223	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C224	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C225	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C226	CCUS1H221JA	CAP , CHIP	220PF 50V J	1	EA
C260	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C269	CCUS1A105KC	CAP , CHIP	1UF 10V K	1	EA
C274	CCUS1A105KC	CAP , CHIP	1UF 10V K	1	EA
C277	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C279	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C280	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C289	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C290	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C291	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C293	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C295	CCUS1H272KC	CAP , CHIP	2700PF 50V K	1	EA
C296	CCUS1H272KC	CAP , CHIP	2700PF 50V K	1	EA
C299	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C301	CCUS1H152KC	CAP , CHIP	1500PF 50V K	1	EA
C302	CCUS1H152KC	CAP , CHIP	1500PF 50V K	1	EA
C303	CCUS1H152KC	CAP , CHIP	1500PF 50V K	1	EA
C304	CCUS1H152KC	CAP , CHIP	1500PF 50V K	1	EA
C305	CCUS1H152KC	CAP , CHIP	1500PF 50V K	1	EA
C306	CCUS1H152KC	CAP , CHIP	1500PF 50V K	1	EA
C307	CCUS1H152KC	CAP , CHIP	1500PF 50V K	1	EA
C308	CCUS1H152KC	CAP , CHIP	1500PF 50V K	1	EA
C309	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C310	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C311	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C312	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C313	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C314	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C315	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C316	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C317	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C318	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C319	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C320	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C321	CCUS1H271JA	CAP , CHIP	560PF 50V J	1	EA
C322	CCUS1H271JA	CAP , CHIP	560PF 50V J	1	EA
C323	CCUS1H271JA	CAP , CHIP	560PF 50V J	1	EA
C324	CCUS1H271JA	CAP , CHIP	560PF 50V J	1	EA
C325	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C326	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C327	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C328	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C329	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C330	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C331	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C332	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C333	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C334	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C335	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C336	CCUS1H561JA	CAP , CHIP	560PF 50V J	1	EA
C337	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C338	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C339	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C340	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C350	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C351	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C352	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA

Ref. Designator	Part Number	Description		Qty	
PCB , INPUT		**CUP12028**			
C353	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C354	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C355	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C356	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C357	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C369	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C370	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C381	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C382	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C383	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C384	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C385	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C386	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C387	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C388	CCUS1H223KC	CAP , CHIP	0.022UF 50V K	1	EA
C391	CCUS1H151JA	CAP , CHIP	150PF 50V J	1	EA
C392	CCUS1H151JA	CAP , CHIP	150PF 50V J	1	EA
C393	CCUS1H151JA	CAP , CHIP	150PF 50V J	1	EA
C394	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C395	CCUS1H151JA	CAP , CHIP	150PF 50V J	1	EA
C396	CCUS1H151JA	CAP , CHIP	150PF 50V J	1	EA
C397	CCUS1H151JA	CAP , CHIP	150PF 50V J	1	EA
C398	CCUS1H151JA	CAP , CHIP	150PF 50V J	1	EA
C532	CCUS1H182KC	CAP , CHIP	1800PF 50V K	1	EA
C534	CCUS1H182KC	CAP , CHIP	1800PF 50V K	1	EA
C535	CCUS1H182KC	CAP , CHIP	1800PF 50V K	1	EA
C536	CCUS1H182KC	CAP , CHIP	1800PF 50V K	1	EA
C537	CCUS1H182KC	CAP , CHIP	1800PF 50V K	1	EA
C538	CCUS1H182KC	CAP , CHIP	1800PF 50V K	1	EA
C539	CCUS1H182KC	CAP , CHIP	1800PF 50V K	1	EA
C540	CCUS1H182KC	CAP , CHIP	1800PF 50V K	1	EA
C601	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C603	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C605	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C607	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C609	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C611	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C613	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C615	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C617	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C619	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C621	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C623	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C625	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C627	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C629	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C631	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C701	CCUS1H150JA	CAP , CHIP	15PF 50V J	1	EA
C702	CCUS1H150JA	CAP , CHIP	15PF 50V J	1	EA
C704	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C705	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C707	CCUS1H102KC	CAP , CHIP	1000PF 50V K	1	EA
C708	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C716	CCUS1H151JA	CAP , CHIP	150PF 50V J	1	EA
C718	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C719	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C722	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C723	CCUS1H473KC	CAP , CHIP	0.047UF 50V K	1	EA
C725	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C727	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA
C729	CCUS1H104KC	CAP , CHIP	0.1UF 50V K	1	EA