

CARVER

Powerful • Musical • Accurate

CT-29v Audio/Video
Preamplifier/Tuner
with Dolby Pro Logic™ Surround

Owner's Manual

CARVER

1. Safety Instructions

1. Read Instructions — All the safety and operation instructions should be read before the Carver Component is operated.

2. Retain Instructions — The safety and operating instructions should be kept for future reference.

3. Heed Warnings — All warnings on the Component and in these operating instructions should be followed.

4. Follow Instructions — All operating and other instructions should be followed.

5. Water and Moisture — The Component should not be used near water - for example, near a bathtub, washbowl, kitchen sink, laundry tub, in a wet basement, or near a swimming pool, etc.

6. Ventilation — The Component should be situated so that its location or position does not interfere with its proper ventilation. For example, the Component should not be situated on a bed, sofa, rug, or similar surface that may block any ventilation openings; or placed in a built-in installation such as a bookcase or cabinet that may impede the flow of air through ventilation openings.

7. Heat — The Component should be situated away from heat sources such as radiators, or other devices which produce heat.

8. Power Sources — The Component should be connected to a power supply only of the type described in these operation instructions or as marked on the Component.

9. Power Cord Protection — Power-supply cords should be routed so that they are not likely to be walked upon or pinched by items placed upon or against them, paying particular attention to cords at plugs, convenience receptacles, and the point where they exit the Component.

10. Cleaning — The Component should be cleaned only as recommended in this manual.

11. Non-use Periods— The power cord of the Component should be unplugged from the outlet when unused for a long period of time.

12. Object and Liquid Entry — Care should be taken so that objects do not fall into and liquids are not spilled into the inside of the Component.

13. Damage Requiring Service — The Component should be serviced only by qualified service personnel when:

- A. The power-supply cord or the plug has been damaged; or
- B. Objects have fallen, or liquid has spilled into the Component; or
- C. The Component has been exposed to rain; or
- D. The Component does not appear to operate normally or exhibits a marked change in performance; or
- E. The Component has been dropped, or its cabinet damaged.

14. Servicing — The user should not attempt to service the Component beyond those means described in this operating manual. All other servicing should be referred to qualified service personnel.

15. Power Lines — An outdoor antenna should be located away from power lines.



CAUTION



RISK OF ELECTRIC SHOCK
DO NOT OPEN

**CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK
DO NOT REMOVE COVER (OR BACK)
NO USER-SERVICEABLE PARTS INSIDE
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL**



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



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

PORTABLE CART WARNING



Carts and stands - The Component should be used only with a cart or stand that is recommended by the manufacturer. A Component and cart combination should be moved with care. Quick stops, excessive force, and uneven surfaces may cause the Component and cart combination to overturn.

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

Pour prévenir les chocs électriques ne pas utiliser cette fiche polarisée avec un prolongateur, un prise de courant ou une autre sortie de courant, sauf si les lames peuvent être insérées à fond sans laisser aucune partie à découvert.

17. Grounding or Polarization — Precautions should be taken so that the grounding or polarization means of the Component is not defeated.

18. Internal/External Voltage Selectors — Internal or external line voltage selector switches, if any, should only be reset and re-equipped with a proper plug for alternate voltage by a qualified service technician. See an Authorized Carver Dealer for more information.

19. Attachment Plugs for Alternate Line Voltage (Dual voltage models only) — See your Authorized Carver Dealer for information on the attachment plug for alternate voltage use. This pertains to dual-voltage units only.

This apparatus does not exceed the Class A/Class B (whichever is applicable) limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

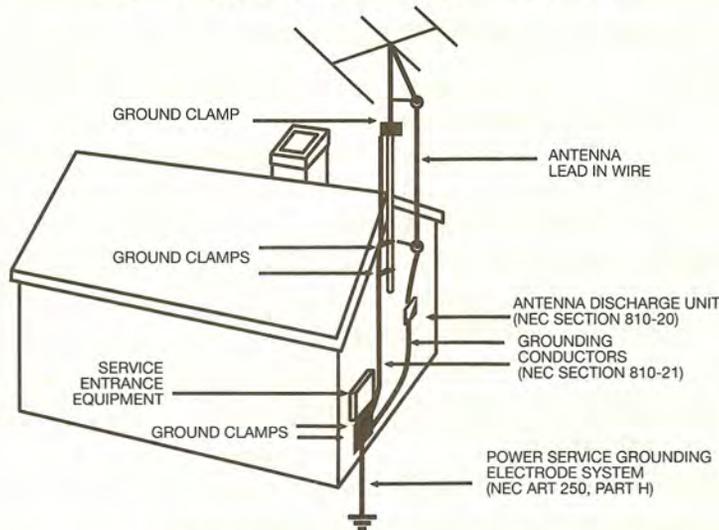
ATTENTION — Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de class A/de class B (selon le cas) prescrites dans le règlement sur le brouillage radioélectrique édicté par les ministere des communications du Canada.

WARNING – TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

CAUTION: TO PREVENT ELECTRIC SHOCK, MATCH WIDE BLADE OF PLUG TO WIDE SLOT, FULLY INSERT.

ATTENTION: POUR ÉVITER LES CHOCs ÉLECTRIQUES, INTRODUIRE LA LAME LA PLUS LARGE DE LA FICHE DANS LA BORNE CORRESPONDANTE DE LA PRISE ET POUSSER JUSQU'AU FOND.

EXAMPLE OF ANTENNA GROUNDING ACCORDING TO NATIONAL ELECTRICAL CODE INSTRUCTIONS CONTAINED IN ARTICLE 810—"RADIO AND TELEVISION EQUIPMENT"



NEC—NATIONAL ELECTRICAL CODE.

NOTE TO CATV INSTALLER

This reminder is to call the CATV system installer's attention to Article 820-40 of the NEC that provides guidelines for proper grounding and in particular, specifies that the cable ground shall be connected to the grounding system of the building as close to the point of cable entry as practical.

OUTSIDE ANTENNA GROUNDING

If an outside antenna is connected to the receiver, be sure the antenna system is grounded so as to provide some protection against voltage surges and built-up static charges. Article 810 of the National Electrical Code, ANSI/NFPA 70, provides information with regard to proper grounding of the lead-in wire to an antenna-discharge unit, connection to grounding electrodes, and requirements for the grounding electrode. See Figure above.

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2. Introduction

Congratulations on your purchase of a new Carver CT-29v Dolby Pro-Logic Audio/Video Preamplifier/Tuner. We expect that its sophisticated engineering and meticulous craftsmanship will provide you with many years of listening enjoyment.

At the heart of the CT-29v is the power of DSP (Digital Signal Processing), which is used to perform the intricate decoding and logic steering of the Dolby Surround Pro-Logic encoded audio signal. Dolby Pro-Logic functions in the same way as the decoding found in Dolby Stereo cinema processors used in state-of-the-art movie theaters. The key to the system is center channel active logic steering that provides a natural sound stage and a realistic simulation of the environment seen on the video screen, independent of viewer position.

The CT-29v also features an auto-balance circuit that continuously monitors and adjusts the relative levels of the source material input for proper decoding.

Other DSP modes include "Movie Surround", which provides extended surround delay of up to 90mS. For conventional stereo sources, we have provided a "Hall 1" and "Hall 2" ambience generator that convincingly simulates the sound of two different-sized concert halls. For monophonic sound sources, such as many sports broadcasts and older movies, the CT-29v has a "matrix" stereo synthesizer that adds a worthwhile spacial dimension. The "3-Channel Logic" mode provides a center "fill" channel and vocal centering for stereo systems that require the left and right speakers to be located far apart.

As an audio/video preamplifier, the CT-29v provides the flexibility you need to integrate today's modern audio/video components. In addition to the four audio only inputs and three audio/video inputs, the CT-29v has three S-video input and output connectors, and an external processor loop.

As a Multi-room preamplifier, the CT-29v allows you to listen to an audio source in another room, which can be independently controlled from the other room with an optional IR-R7 infrared receiver connected to the CT-29v.

The CT-29v allows you to dub any audio source to a tape recorder, and any video source to a VCR quickly and easily. And you can proceed with the recording while you are watching or listening to a different program.

The "on-screen display" is a feature you will come to appreciate as a useful complement to the fluorescent display on the front panel. This can be used to quickly inform you of the status of all the CT-29v settings at a glance, right on your TV screen.

Your CT-29v preamplifier was designed by people with a lifetime commitment to providing the world's finest components for music reproduction and home entertainment. Thanks for placing your confidence in Carver. We know your new preamplifier will provide many years of listening enjoyment.

About This Manual

As you are no doubt aware already, the CT-29v is an extraordinarily complex and sophisticated electronic component. Consequently, installing your CT-29v and familiarizing yourself with its operation probably will require more time and attention than you have been accustomed to with previous components. However, paying careful attention to this manual is particularly important. In the long run, reading the manual will save time, and perhaps avoid some needless frustration.

You are probably eager to hook up your new CT-29v so you can experience its superb sonic performance in your system. Right now you are probably asking yourself: "Do I have to read this entire manual before I can begin?"

No. You can do it in stages if you like. The contents are structured progressively, so you can install your CT-29v and enjoy basic operations before proceeding to the more sophisticated functions. You should at least skim through Section 6 (*Operation*) before you begin, and then follow the instructions in detail as you unpack, install and learn the basic operating functions. The section on Front Panel Features gives a brief description of each of the CT-29v buttons and controls. From there, you may then be referred to

another section of the manual that contains a more detailed description of a feature or related operation. Then, once your unit is "up and running", you can proceed through the rest of the manual, becoming familiar with the remote control, Multi-room and surround sound features while enjoying music.

Despite its many sophisticated switching and programming features, the actual opera-

tion of the CT-29v is surprisingly "user friendly". Most operations can be accomplished with the push of a button. Some of the more complicated operations, such as programming the remote control, don't have to be remembered because they are performed only once. However, until all operating procedures become second-nature, keep this manual close at hand for reference.

3. CT-29v Features

- ❑ Advanced Dolby Pro-Logic Surround decoder with adjustable delay and auto-input balance provides theater-like sound
- ❑ Movie, 3 Channel Logic, Hall 1, Hall 2 and Matrix Surround modes with DSP and adjustable delay from 0-90mS
- ❑ DSP memory automatically recalls the last surround mode, center mode and delay setting for the selected video input source
- ❑ Seven audio inputs, three composite video inputs and three S-video inputs
- ❑ Five outputs for Surround Sound operation: Left and Right Front, two Surround and one Center
- ❑ 18dB/octave Subwoofer output with independently adjustable volume control
- ❑ Three composite video outputs and three S-video outputs, including one for video monitor
- ❑ Independent Multi-room input selector for playing different sources in another room
- ❑ Independent volume control for Multi-room output
- ❑ Easy-to-read fluorescent display lets you confirm settings at a glance
- ❑ On-screen function display appears for ease of monitoring setting changes
- ❑ Digital frequency-synthesis AM/FM tuner
- ❑ Auto-scan and manual step tuning
- ❑ Equipped with a CATV (FM) coaxial input in addition to the regular AM/FM antenna inputs
- ❑ Random presetting of up to 30 AM/FM (or CATV) stations
- ❑ Signal strength meter
- ❑ Video signals recordable on either of two VCRs
- ❑ EQ In/Out for connecting an external processor into the signal path
- ❑ Bass and Treble tone controls, and Loudness button
- ❑ Left/Right Balance control
- ❑ Vocal Zoom control for enhancing vocal presence
- ❑ Motor-driven master volume control can be operated from the remote control unit
- ❑ Headphone jack
- ❑ Full function programmable remote control
- ❑ RC-5 remote control input and output bus
- ❑ Two AC outlets, one switched and one unswitched

4. Unpacking and Paperwork

Carefully unpack your CT-29v and keep the original carton and packing materials for future moving, shipment or long-term storage.

After opening the box, please check for any visible signs of damage that were not apparent from the outside of the box. If you do encounter what appears to be concealed damage, please consult your Carver Dealer before proceeding to further unpack or install the unit.

Important Paperwork

Make sure to save your sales receipt. Your receipt is extremely important to establish the duration of your Limited Warranty, and for insurance purposes. Next, make a note of the serial number which is located on the back of the CT-29v. Record it in the space provided below for convenient reference.

Model: CT-29v

Serial Number: _____

Purchased at: _____

Date: _____

Finally, take a moment to fill out the Warranty Registration Card packed with the CT-29v and return it to Carver. This provides us with important information about you, our valued customer.

5. Installation

Location and General Precautions

Observe the following precautions when choosing a location for the CT-29v:

- Do not expose the unit to rain or moisture.
- Protect from prolonged exposure to direct sunlight.
- Avoid excessive exposure to extreme cold or dust.
- Avoid exposure to electrostatic discharge.
- Do not place heavy objects on the unit.
- Protect from heat and allow adequate ventilation. Place away from direct sources of heat, such as heating vents and radiators.

All components produce some heat during operation, so make sure that ventilation holes are not covered, and that air is allowed to circulate freely behind, beside and above the unit. Excessive heat is the single greatest source of both short-term and long-term component failure.

If a fluid or foreign object does enter the unit, disconnect the power plug and contact an authorized dealer or service center. Do not pull out the plug by pulling on the cord; grasp the plug firmly.

Getting Started

For information on selection of speakers and amplifiers for surround sound operation, see *About Surround Sound* on page 33.

No special tools are required to make connections to the CT-29v. If you are installing new speakers for surround sound or Multi-room operation, you may require a wire cutter and wire stripper, or other appropriate tools.

No connecting cables are supplied with the CT-29v. RCA-type interconnect cables are often supplied with the source units. Additional cables are available from your Carver dealer.

If installing in a cabinet, provide sufficient cable slack to allow turning the preamplifier around 180 degrees to make all connections. If this is not possible, a small lamp and hand mirror may be helpful in making some connections.

Connection Tips

Before launching into the actual cable-connection frenzy of setting up your new system, consider the following tips.

- Make sure all components are OFF before making any connections. It's a good idea to plug in your AC power cord last to avoid accidentally turning on the unit while installing.
- Make sure that "left is hooked to left and right is hooked to right" at each connection. The obvious way to assure this is to assign one hook-up cord plug color to left and the other to right. Generally RED is used to signify RIGHT. White, grey or black then represents left.
- Whenever possible, keep power cords away from signal cables (inputs from CD player, tape deck, etc.) to prevent hum. While hum is less of a problem today than it was in the past, noise can still find its way into your system if a component's power cord becomes too intimately involved with a hook-up cable. Carver components' power cords and convenience outlets are all on the right side of the chassis (when viewed from the back). This allows you to bundle all the component power cords and keep them separate from signal connections.
- Choose reliable hook-up cables (also called interconnects, patch cords or RCA cables). There are lots of different grades of hook-up cables. You can pay more than \$50 per foot for some of them! Whether or not you hear an improvement in sound quality with "audiophile" interconnects is up to your own ears. However, really CHEAP or old connection cables can sometimes DIS-connect themselves inside, causing hum or a loss of sound in one or both channels. Before you send a component in for service, swap hook-up cables to see if they're the culprit.
- For video connections, use connecting cables that are specifically designed for video. Video signals are far higher in frequency than audio and can often benefit from a higher quality interconnect. Several companies make specialized audio/video cables with two audio and one video conductor. Consult your Carver dealer.
- DON'T PANIC! While there are more than fifty possible connections on the back of the CT-29v, matching them up with your existing equipment is simple if you make the connections methodically, one at a time. This is the safest way to avoid cross-connecting channels or confusing signal inputs with outputs.

Rear Panel Connections

ANTENNA CONNECTIONS

A. CATV antenna terminal (75 ohm)

For connecting a CATV cable. This is used with a 75 ohm coaxial cable and F-connector.

B. FM antenna terminal (75 ohm)

For connecting an external FM antenna with a 75 ohm coaxial cable and F-connector. If you choose to use the supplied indoor folded dipole antenna, you will need to first connect it to the supplied transformer/adaptor (balun).

C. AM antenna and ground terminals

For connecting the supplied AM loop antenna. The polarity of this connection doesn't matter. Just connect one antenna wire to the "AM" terminal and the other wire to the "GND" terminal.

If the supplied loop antenna gives unsatisfactory results, you may require an outdoor antenna. Use the AM terminal for this. An earth grounding lead can be connected to the GND terminal to further reduce interference.

AUDIO INPUTS AND OUTPUTS

D. PHONO input jacks

Connect to the output jacks of a turntable equipped with a moving magnet (MM) cartridge. Connect the turntable's ground wire to the GND terminal (E).

⚡ **Note:** If you hear a humming sound or other noise when the ground wire is connected, try disconnecting the ground wire.

F. CD input jacks

Connect to the audio output jacks of a CD player.

G. TAPE INput/OUTput jacks

Connect the IN jacks to a cassette deck's output (PLAY) jacks, and connect the OUT jacks to the cassette deck's input (REC) jacks.

H. DCC INput/OUTput jacks

Connect the IN jacks to a DCC (Digital Compact Cassette) deck's output (PLAY) jacks, and connect the OUT jacks to the deck's input (REC) jacks.

⚡ **Note:** A second cassette deck, reel-to-reel, DAT or MD player can be connected here if you do not own a DCC deck.

I. LD input jacks

Connect to the audio output jacks of a laser disc player.

J. VCR1 INput/OUTput jacks

Connect the IN jacks to a VCR's audio output jacks and the OUT jacks to the VCR's audio input jacks.

K. VCR2 INput/OUTput jacks

Connect the IN jacks to a second VCR's audio output jacks and the OUT jacks to the VCR's audio input jacks.

L. EQ INput/OUTput jacks

Remove the U-shaped jumpers from these jacks to make this connection. These jacks allow inserting an external processor such as an equalizer or digital delay into the signal chain. This insertion point is located after all the inputs (including the TAPE and VCR loops), but before the Surround Sound decoding circuits, Tone, Balance and the Master Volume control.

Connect the IN jacks to an external processor's audio output jacks and the OUT jacks to the processor's audio input jacks.

⚡ **Note:** Leave the U-shaped jumpers installed when not using these jacks, or there will be no output from the CT-29v.

VIDEO INPUTS AND OUTPUTS

M. LD VIDEO and S-VIDEO input jacks

Connect to the video output jack of a laser disc player.

N. VCR1 VIDEO and S-VIDEO INput/OUTput jacks

Connect the IN jack to your main VCR's video output jack, and connect the OUT jack to the VCR's video input jack.

O. VCR2 VIDEO and S-VIDEO INput/OUTput jacks

Connect the IN jack to a second VCR's video output jack, and connect the OUT jack to the VCR's video input jack.

P. TV MONitor VIDEO and S-VIDEO output jacks

Connect to the video input jack on your TV. This jack routes the video source selected on the CT-29v to your TV monitor.

Notes on the S-VIDEO input/output jacks

- The circuits for the S-VIDEO input/output jacks and the composite (RCA) Video input/output jacks are separate and thus function independently.
- The CT-29v Input Selector buttons switch both Video and S-Video inputs at the same time, but it cannot convert from Video to S-Video or from S-Video to Video.
- The video signals from the On-Screen Display (OSD) circuit are not output through the VCR Video or S-Video output jacks, or through the TV MONI S-Video output jack. If the OSD feature is desired, use the TV MONI composite Video output jacks.

- If VCR1 is connected using both the VCR1 S-VIDEO jack and the VCR1 RCA jacks, signals are output to both jacks when VCR1 is selected. Select whether to monitor the S-VIDEO signal or the RCA jack video signal on the monitor TV side.
- For details on S-VIDEO, refer to the instruction manual provided with your monitor TV.
- **Caution** when using S-VIDEO jacks: Due to the circuit configuration of this unit, be sure to use the same type of connection for both the input and the output of VCR1 and 2. Do not attempt to use a modified S-VIDEO cable for the input and RCA jack for the output, or RCA jack for the input and S-VIDEO for the output. This could damage your A/V system.
- For connecting S-VIDEO jacks, use commercially available S-VIDEO connection cables. Consult your Carver dealer for availability.

MAIN AUDIO OUTPUTS

Q. FRONT output jacks

Connect to the input jacks of the amplifier used to drive the main left and right speakers.

R. SURROUND output jacks

Connect to the input jacks of the amplifier used to drive the surround (rear) speakers.

S. CENTER output jack

Connect to the input jack of the amplifier used to drive the center channel speaker.

T. SUBWOOFER output jack

An optional connection provided for adding a subwoofer speaker to your system. This may be desirable particularly if your main (FRONT) speakers are lacking in low frequency response (below 80 Hz).

Connect to the input jack of an amplifier used to drive a subwoofer.

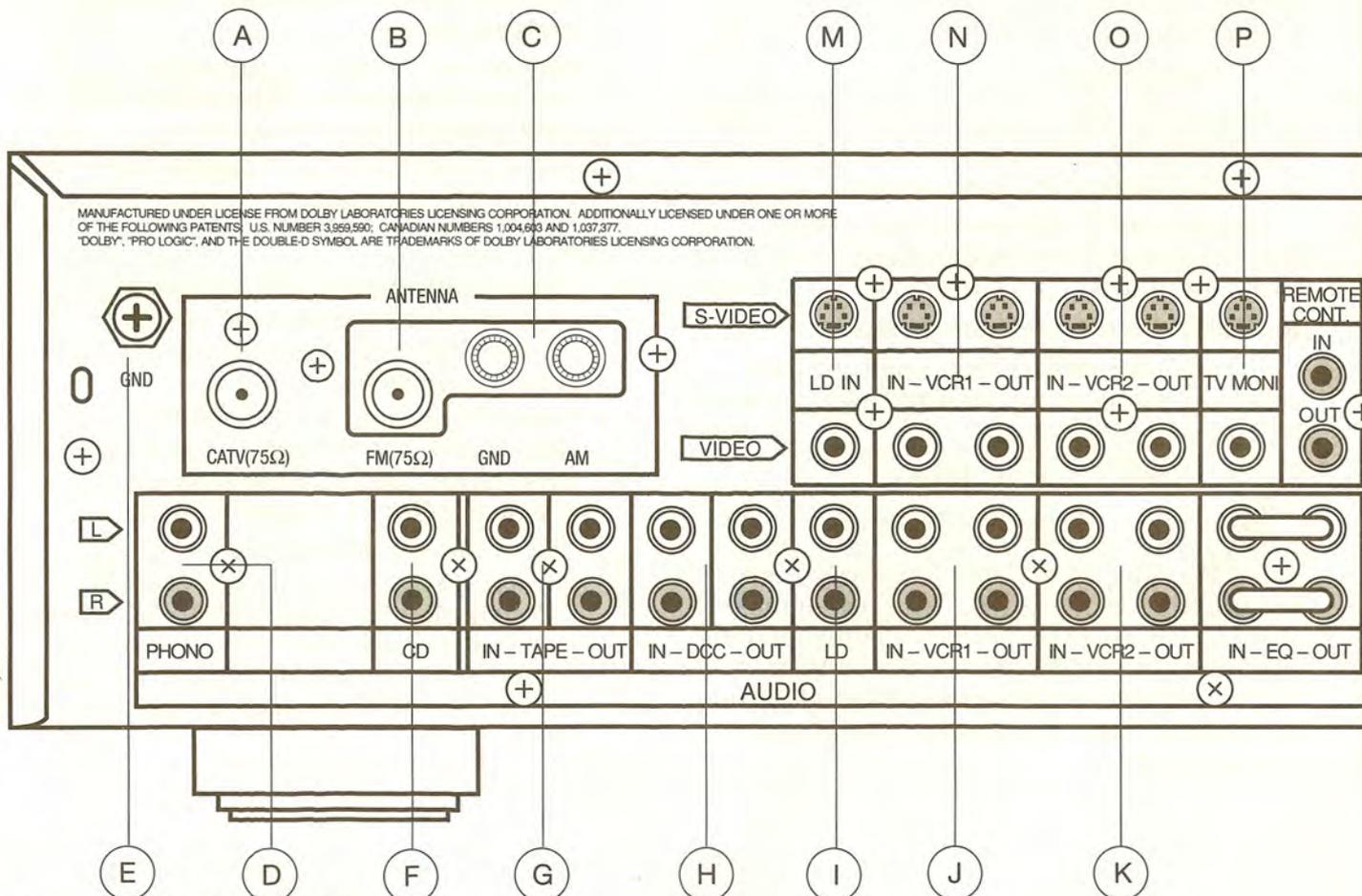


Figure 1. CT-29v Rear Panel View

U. Subwoofer VOLUME control

Adjusts the relative volume level of the subwoofer speaker with respect to the rest of your speakers.

V. MULTI OUT jacks

Connect to the input jacks of the amplifier used to drive the speakers in another room, used as a Multi-room.

OTHER CONNECTIONS

W. REMOTE CONT. INput/OUTput jacks

Connect to other components equipped with RC-5 remote in/out jacks. (For more details on RC-5 remote control, see *Remote Control* on page 26.)

X. MULTI ROOM

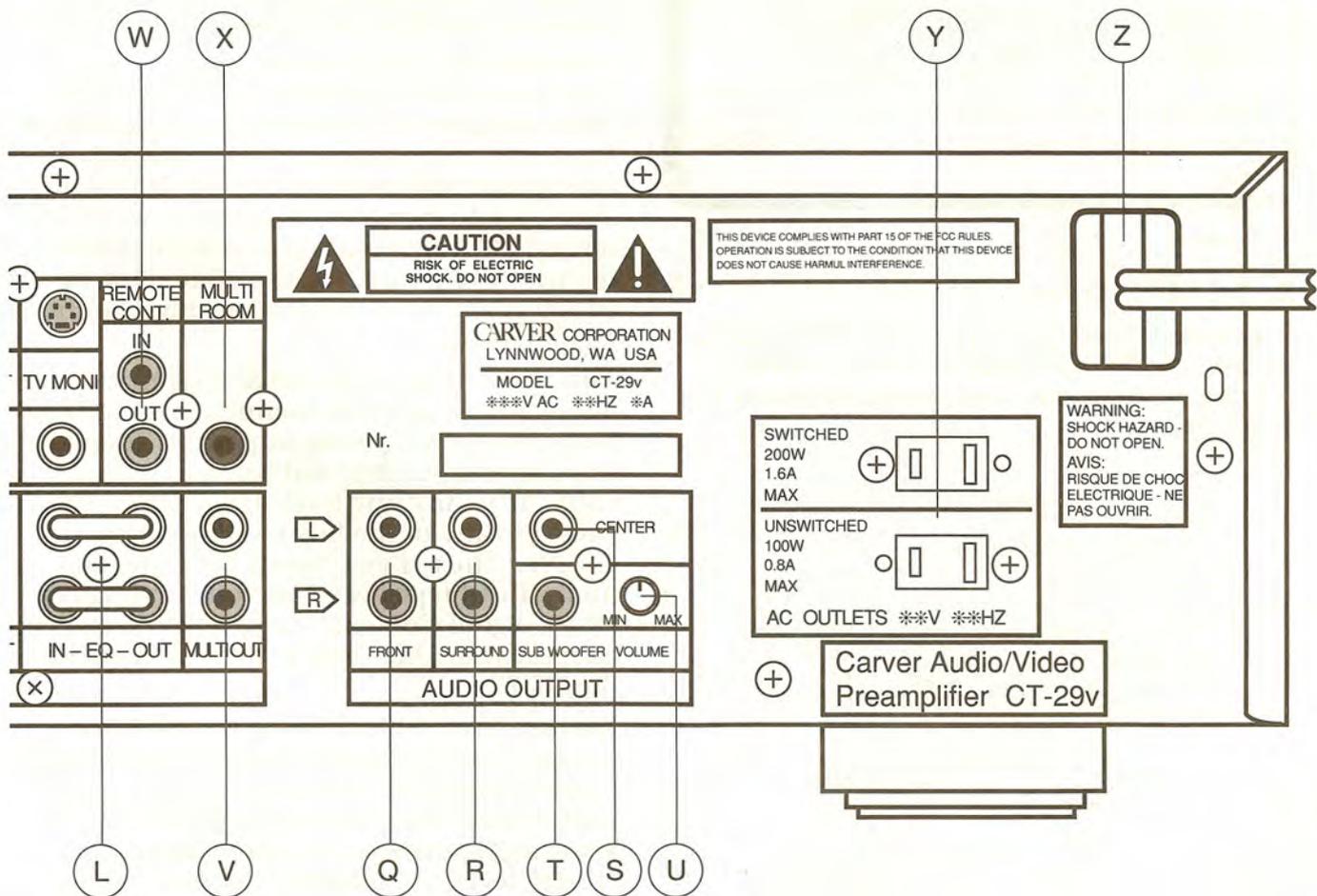
Connect to the (optional) IR-R7 Multi-room infrared receiver module for Multi-room remote control operation.

Y. AC OUTLETS

Connect the power cords of components such as a cassette deck and CD player to these outlets.

Both SWITCHED and UNSWITCHED outlets are provided. The one marked SWITCHED provides power only when the CT-29v is turned on and is useful for a component which you use every time you play your system such as an equalizer or your most-used sound source. The one marked UNSWITCHED is always live as long as the CT-29v is plugged into a live outlet. A component connected here may be left on permanently, or may be switched off with its own power switch.

Note: In order to avoid potential turn-on thumps, anything plugged in here should be powered up BEFORE the CT-29v is turned on.



Be sure the total power consumption of the connected components does not exceed the values listed below:

SWITCHED 200W MAX TOTAL
UNSWITCHED 100W MAX TOTAL

CT-29v switched outlet warning

Do not plug a power amplifier into the CT-29v's switched outlets. Make sure the total power consumption of any other components plugged into these outlets does not exceed 200 watts.

CT-29v unswitched outlet warning

If you plug a power amplifier into this outlet, be sure not to exceed the 100 watt rating of the unswitched outlet. Consult the power amplifier's owner's manual to determine its overall power consumption if in doubt.

Note: A power amplifier's power consumption rating is different than its rated power. In fact, it is usually much larger than its rated power output, so be sure you are looking at the right specification.

Z. AC LINECORD

Connect to an outlet properly configured for the line voltage specified for your model. If using an extension cord, we recommend 16 gauge or heavier.

SYSTEM CONFIGURATIONS

The following pages contain drawings of typical connections that you might make in your installation. These drawings demonstrate how each of the inputs and outputs on the rear panel of the CT-29v are interconnected with other audio and video components.

Your particular installation will probably not use all of the connections shown, although if you are using the CT-29v as the center of a full-fledged audio/video system you will use many or most of the connections shown.

The inputs and outputs on the CT-29v are labeled to correspond to the most common audio and video components in use today. However, it is perfectly okay to connect components other than those indicated by the labels to unused inputs or outputs, so long as they are line level signals.

A quick lesson on input/output levels

Input and output levels for audio equipment are usually divided into three categories.

Phono Level: This is a very low level signal that comes from the cartridge of your turntable. Because of its extremely low voltage, it has a special input connection provided on most preamplifiers and receivers. It provides extra gain to increase the signal, as well as reverse RIAA equalization to restore the flat frequency response that was altered by the equalization that is used in making phonograph records.

Line Level: This is the signal level that comes out of almost all audio components produced today, except for power amplifiers. It ranges from several hundred millivolts to several volts (AC). Any line level signal can be connected to any of the line level inputs on the CT-29v. Thus, if you have a DAT (Digital Audio Tape) tape deck, but you don't have a DCC (Digital Compact Cassette) deck, you can connect your DAT deck to the DCC input on the CT-29v.

Speaker level: This is the signal level that comes out of the speaker output terminals on a power amplifier or receiver. It can range from several volts to several tens of volts (AC). Some high-powered amplifiers can reach voltage levels approaching that present on a household AC outlet! These connections should only be made to a speaker.

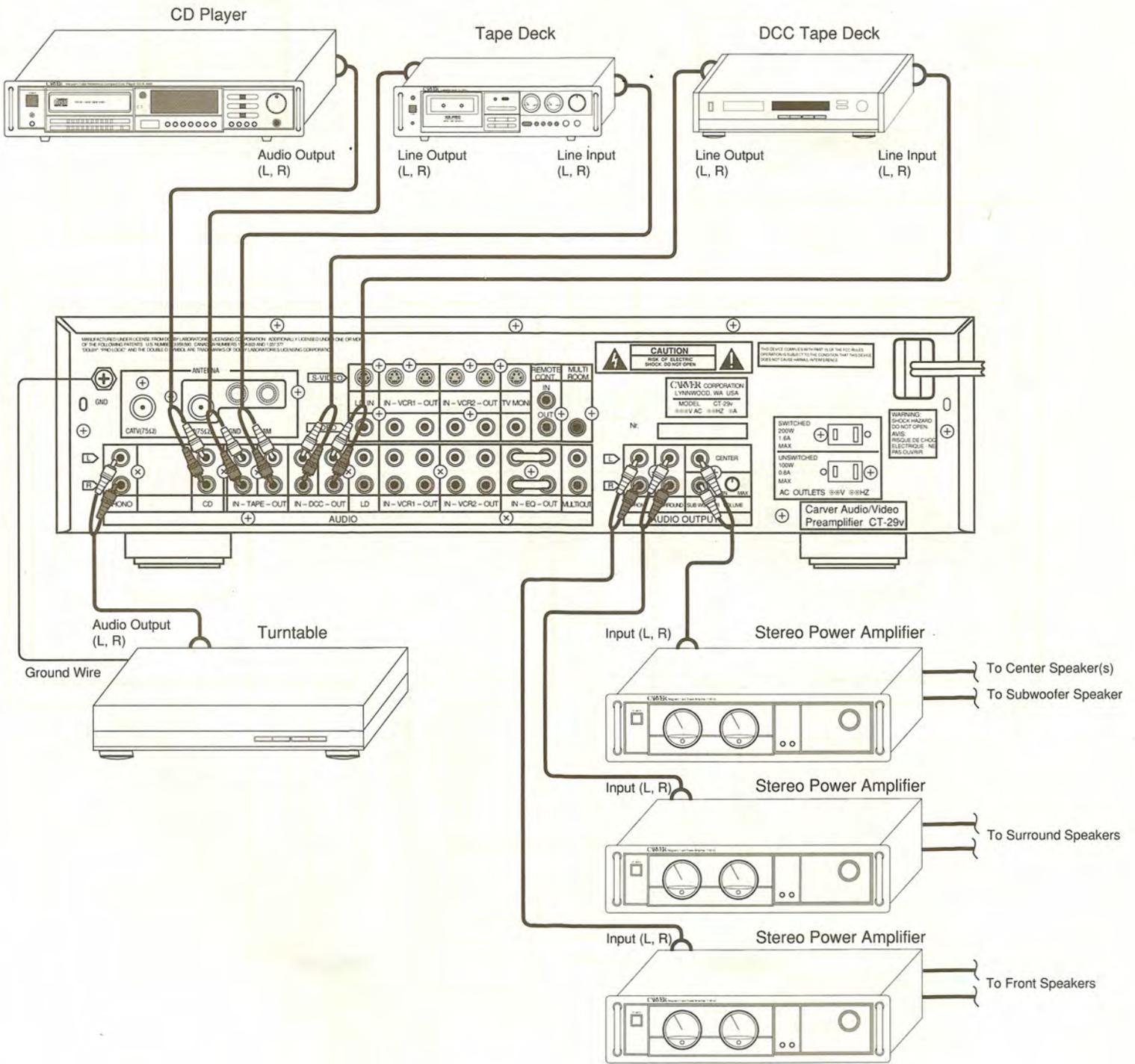


Figure 2. Sample Audio Connections

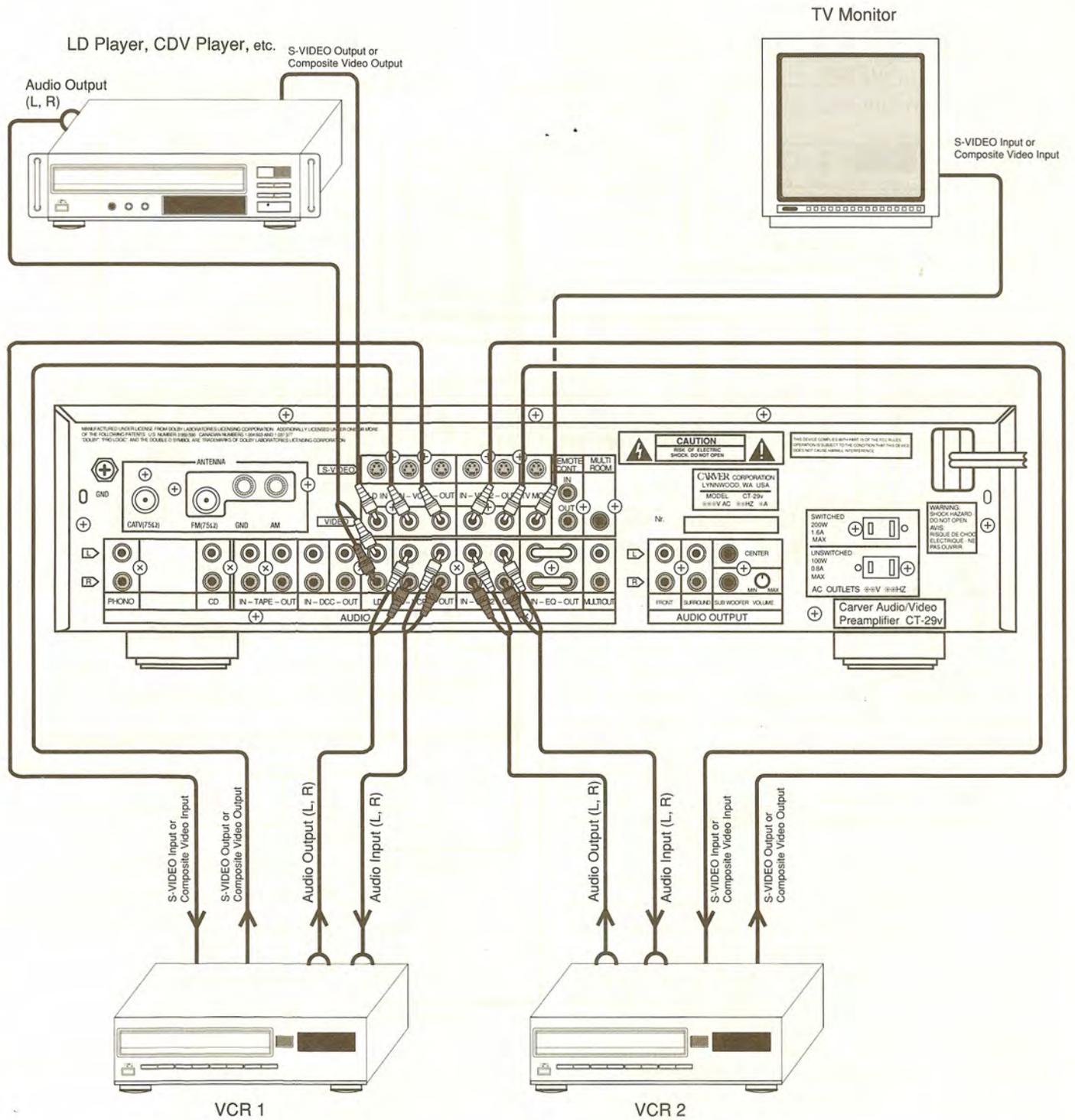


Figure 3. Sample Video Connections

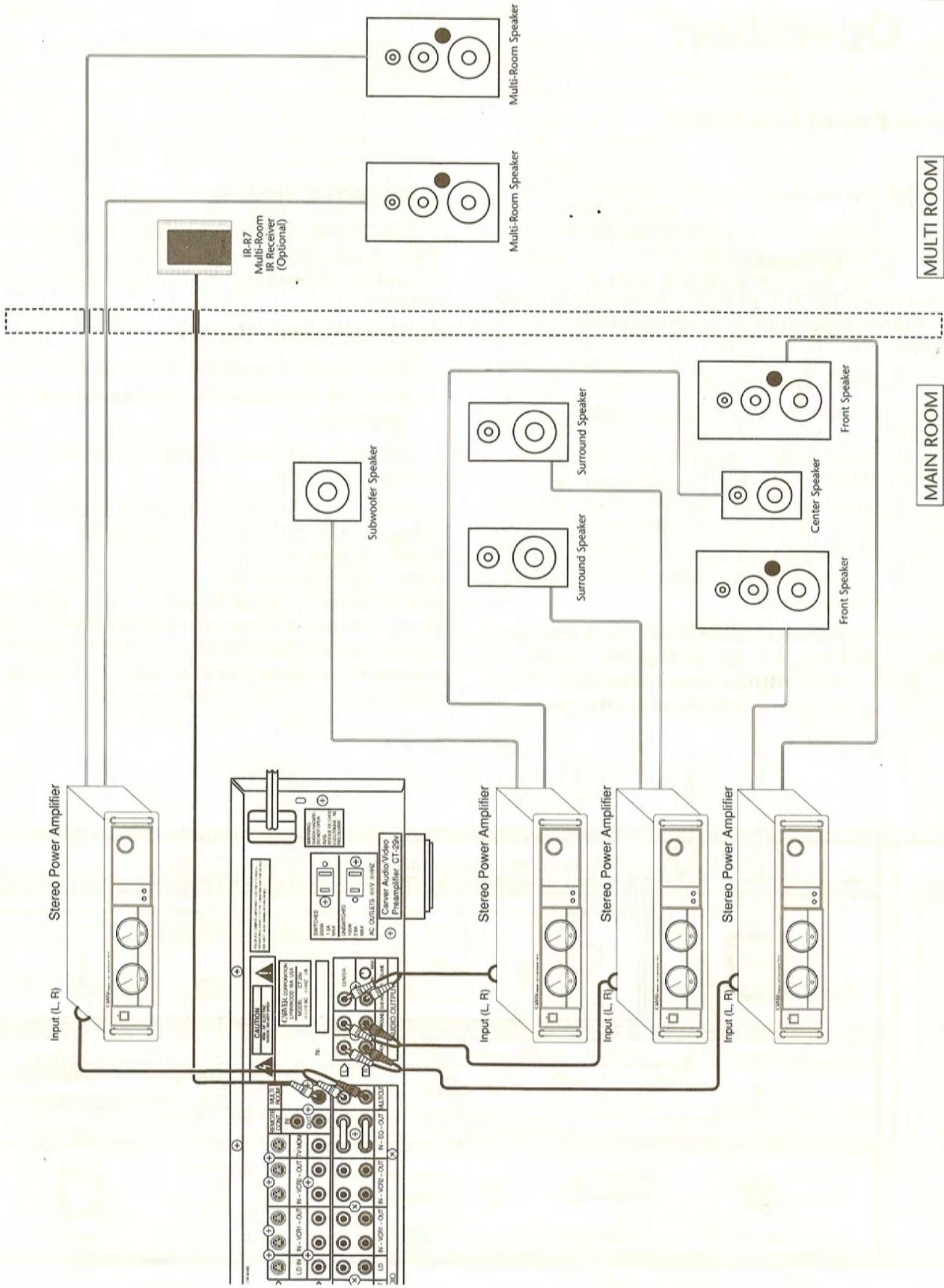


Figure 4. Sample Multi-Room Connections

6. Operation

Front Panel Features

1. POWER switch

When this switch is pressed in, the power turns ON and indicators appear in the display panel. The CT-29v will always turn on with the settings that it had when it was last turned off. Pressing the switch again turns the CT-29v OFF.

2. STANDBY indicator

The CT-29v can only be placed into STANDBY mode by pressing the top POWER button on the remote control after the front panel POWER switch has been turned on. When in Standby mode, the STANDBY indicator will light. This indicates that the pre-amplifier can be activated again with the remote control. Multi-room functions are still operational while in Standby.

If the front panel POWER switch is used to turn the unit off, it is not in Standby mode and the remote control cannot reactivate the CT-29v. Multi-room operation is also disabled.

3. REMOTE SENSOR

This window receives infrared signals from the remote control unit. Aim the remote control at this sensor for proper signal transmission.

4. Fluorescent Display

Displays the operating status of the CT-29v.

5. PHONES socket for stereo headphones

This jack accepts a standard 1/4-inch stereo headphone plug.

Note: The Main Room audio outputs (FRONT, CENTER, SURROUND and SUBWOOFER) are automatically disconnected when headphones are plugged into the PHONES jack. Since sound to the PHONES jack is output in two-channel stereo (left and right), use the DSP MODE button to turn the surround mode to STEREO when using headphones.

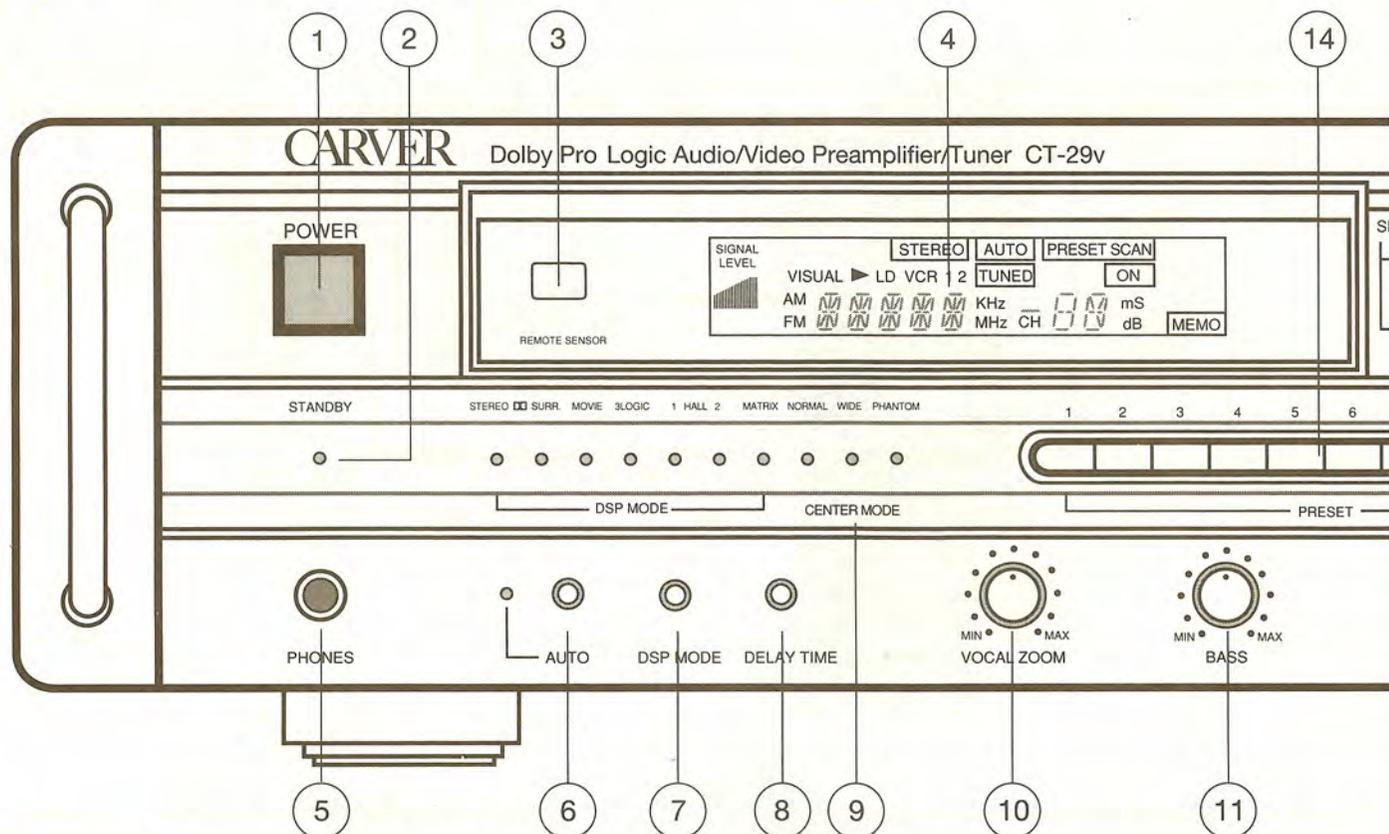


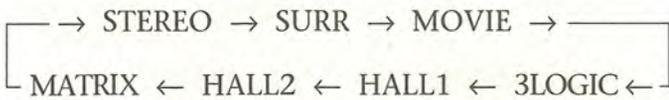
Figure 5. CT-29v Front Panel View

6. AUTO

The Center Mode and the Delay Time settings are determined by the nature of your particular surround sound system. In most cases, the same settings are used every time you use surround sound. The AUTO button allows the CT-29v to "memorize" the last DSP Mode, CENTER Mode and DELAY TIME setting for each of the three video inputs (LD, VCR1 and VCR2). If an audio-only input source is selected while AUTO is activated (indicated by the red LED), the CT-29v defaults to STEREO.

7. DSP MODE

This button is used to select the surround effect that you want to use on the selected audio or video source. Repeatedly pressing this button will cause the surround modes to alternate in the following order:



A red LED will light below the name of each DSP mode to indicate which surround mode is being used.

STEREO mode is used for normal stereo playback. All DSP circuits are off in STEREO mode. (See *About Surround Sound* on page 33 for more details about DSP modes.)

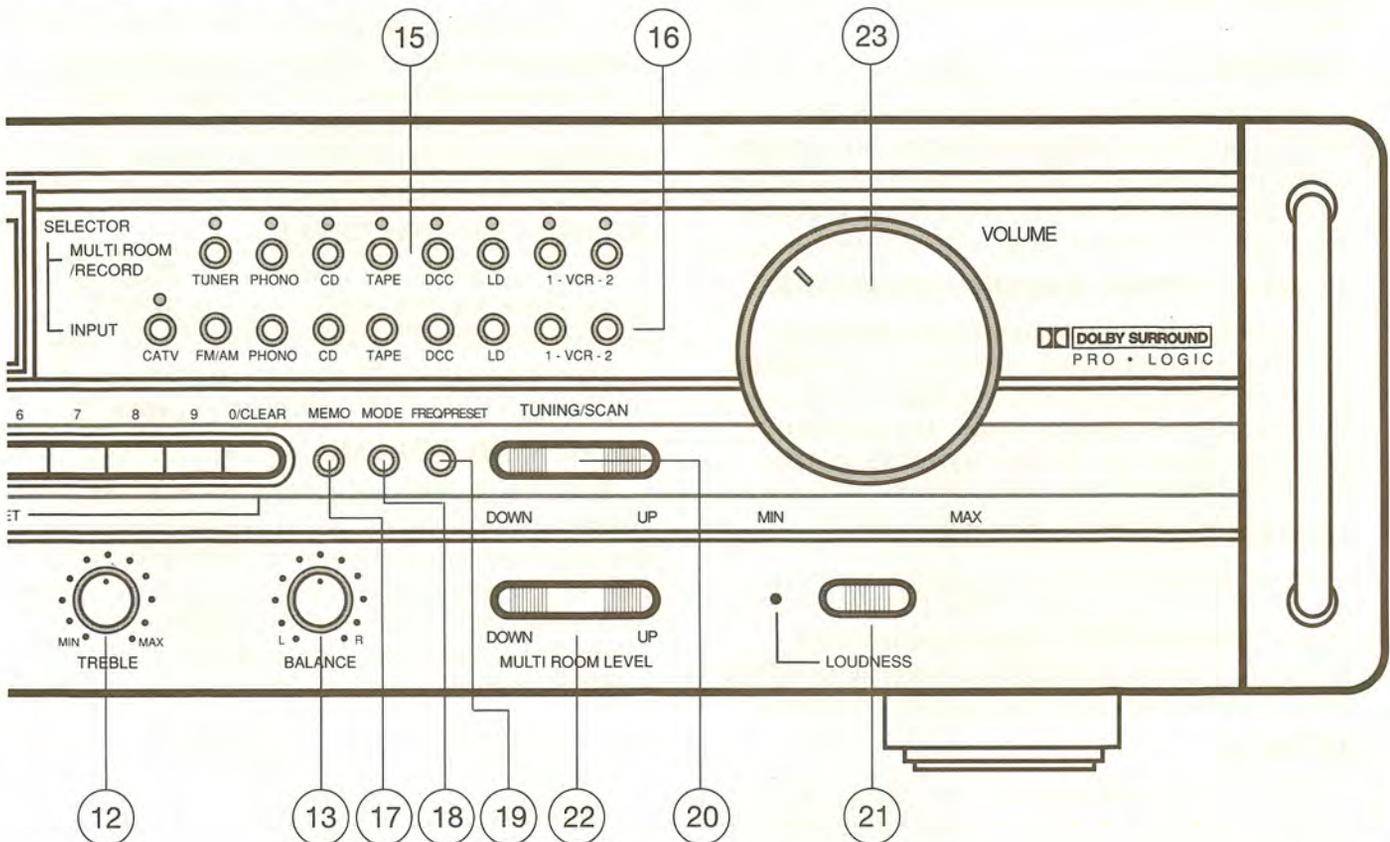
8. DELAY TIME

This button is used to select the amount of delay in the surround output for the surround mode you are currently using. When the DSP mode is in DOLBY SURROUND, this button allows you to vary the delay time from 15mS to 30mS in 5mS increments. When in MOVIE SURROUND, HALL1 or HALL2 SURROUND, or MATRIX SURROUND, the delay can be varied from 0mS to 90mS in 10mS increments.

Pressing this button once will display the current delay time selected. Repeatedly pressing this button will cause the delay time to increment according to the DSP mode selected, as described above.

9. CENTER MODE

There is no button on the front panel to change the Center Mode of operation. Use the CENTER MODE button on the remote control. For more information on CENTER MODE, see *Remote Control* on page 26, and *About Surround Sound* on page 33.



10. VOCAL ZOOM

This knob can be used to adjust the sense of presence to vocals or dialogue in the Center channel when operating in Dolby Surround, Movie or 3 Channel Logic modes. When left in the center position, it has no effect. When rotated fully clockwise it creates the illusion of bringing the vocals forward in space. When rotated fully counter-clockwise it causes the vocals to recede.

11. BASS

This is used to adjust the tonal balance of the low frequencies. Rotating this control fully clockwise provides a 10dB boost at 100Hz, and rotating it fully counter-clockwise provides a 10dB cut at 100Hz.

12. TREBLE

This is used to adjust the tonal balance of the high frequencies. Rotating this control fully clockwise provides a 10dB boost at 10kHz, and rotating it fully counter-clockwise provides a 10dB cut at 10kHz.

13. BALANCE

Use to adjust the sound volume balance between the left and right speakers. Rotating this control clockwise results in decreased left channel volume, and rotating it counter-clockwise results in decreased right channel volume. This control also affects the PHONES output.

14. PRESET

These buttons are used along with the MEMO button when presetting radio station frequencies into the CT-29v memory. Up to 30 stations can be preset using these buttons. See page 22 for presetting instructions.

15. MULTIROOM/RECORD SELECTOR

These buttons select the input source for the Multi-room output. They also determine the signal that appears at the TAPE, DCC, VCR1 and VCR2 output jacks, for recording purposes. See page 24 for recording instructions, and page 39 for Multi-room operation.

16. Main INPUT SELECTOR

These buttons select the input source for the Main room outputs, including Front, Center, Surround and Subwoofer outputs. These buttons operate independently from the MULTIROOM/RECORD SELECTOR buttons.

17. MEMO

This button is used when entering preset station frequencies into memory. See page 22 for presetting instructions.

18. MODE

Press this button to alternate between FM stereo or monaural reception.

19. FREQ/PRESET

Press this button to alternate between the radio frequency or the channel preset number in the display.

20. TUNING/SCAN

Press to change the tuner frequency (when in frequency display mode) or the preset channel (when in preset display mode). The right side of the rocker switch increases the frequency or preset numbers, and the left side decreases the frequency or preset numbers.

This button works in two ways, depending on how you press the button.

A. Manual Tuning. Press and immediately release the button and you will move up and down the frequency range in single steps.

B. Automatic Scan. If you press the button for about one second and then release it, you will scan to the next "strong" station on the FM or AM band, either up or down, depending on which side of the button you press. Holding the button down will cause the tuner to Fast-Forward through the frequencies (or presets) without stopping.

21. LOUDNESS

Because our hearing is less sensitive to low frequencies at softer volume levels, pressing this switch provides a low frequency boost when the volume control is set for low volume playback. A red LED illuminates to indicate that this function is activated.

22. MULTI ROOM LEVEL

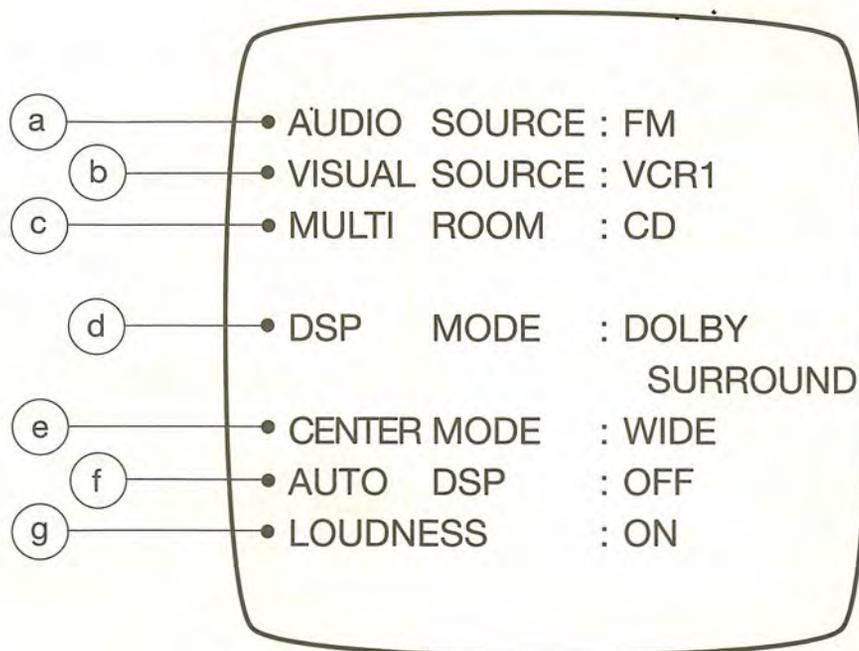
This rocker button controls the volume level at the MULTI OUT, which is independent of the MASTER VOLUME control. The relative volume in dB appears in the display for 5 seconds when this button is pressed.

23. MASTER VOLUME

This adjusts the sound volume over the main room speakers. Turning the control to the right increases the volume. This control adjusts the volume for the Front, Center, Rear and Subwoofer speakers simultaneously. Operation is also possible from the remote control unit.

On-Screen Display

The On-Screen Display (OSD) function can be activated from the remote control. When the OSD button is pressed, the following menu will appear in your TV screen.



a. AUDIO SOURCE

Displays the current audio source selected. FM, AM, CATV, PHONO, CD, TAPE, DCC, LD, VCR1, or VCR2 may be displayed here.

b. VISUAL SOURCE

Displays the current video source selected. LD, VCR1 or VCR2 may be displayed here.

c. MULTI ROOM

Displays the current audio source selected for the Multi-room output. TUNER, PHONO, CD, TAPE, DCC, LD, VCR1 or VCR2 may be displayed here.

d. DSP MODE

Displays the current surround mode. STEREO, DOLBY SURROUND, MOVIE SURROUND, 3CH LOGIC, HALL1 SURROUND, HALL2 SURROUND or MATRIX SURROUND may appear here.

e. CENTER MODE

Displays the current center mode setting. PHANTOM, NORMAL or WIDE may appear here. OFF is displayed when the DSP mode is set to STEREO, HALL1, HALL2 or MATRIX.

f. AUTO DSP

Displays the current AUTO DSP setting. ON or OFF may be displayed here.

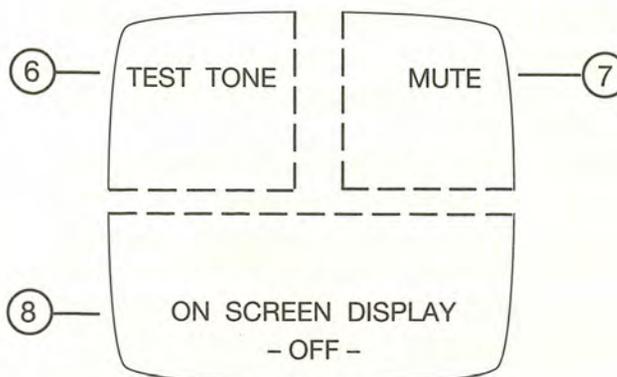
g. LOUDNESS

Displays the current LOUDNESS setting. ON or OFF may be displayed here.

5. When the LOUDNESS button is pressed:
 LOUDNESS: Displays the current setting of the Loudness.



6. When the T-TONE button is pressed:
 TEST TONE is displayed.
 This display only appears when DOLBY SURROUND, MOVIE SURROUND, or 3CH LOGIC are selected.



7. When the MUTE button is pressed:
 MUTE is displayed.
8. When OSD is pushed a second time:
 ON SCREEN DISPLAY -OFF- is displayed.

⚠ **Note:** The On-Screen Display characters are available only at the TV MONI composite video (RCA) output, not at the TV MONI S-Video output jacks, or any of the VCR1 or VCR2 video output jacks.

Playback of Audio and Video Sources

Follow these steps to listen to any audio source, or to view video sources:

1. Set the VOLUME control to the MINimum position.
2. Press the POWER switch to turn on the power.
3. Press the desired function button according to the table shown at the right.

<u>Source Component</u>	<u>Function Button</u>
Tuner (CT-29v)	FM/AM or CATV
Turntable	Phono
Compact Disc Player	CD
Cassette Deck	Tape
Digital Compact Cassette	DCC
Laser Disc Player	LD
Video Cassette Recorder 1	VCR1
Video Cassette Recorder 2	VCR2

4. Start playing the program source.
For stereo sources, set the DSP mode to STEREO. For surround sound encoded programs, see page 34 for instructions on the optimum settings for these controls.
5. Adjust the sound volume using the VOLUME control.
Adjust the sound quality using the tone (BASS/TREBLE) controls.

To listen to an audio source while watching video from a different source, follow these steps:

1. Set the VOLUME control to the MINimum position.
2. Press the POWER switch to turn on the power.
3. Select the desired video source (LD, VCR1 or VCR2).
4. Next, select an audio source (FM/AM, CATV, PHONO, CD or DCC).
5. Adjust the sound volume using the VOLUME control.
Adjust the sound quality using the tone (BASS/TREBLE) controls.

⚠ **Note:** It is not possible to listen to the audio signal from one video source while watching the video signal from another.

FM/AM/CATV Tuner Functions and Preset Programming

Manual Station Selection

1. Set the VOLUME control to MINimum.
2. Press the POWER switch to turn on the power.
3. Press the FM/AM button to select the desired reception band. If the display shows preset station numbers (CH 1, CH 2, etc.), press the FREQ/PRESET button to display only station frequencies.
4. Press the TUNING/SCAN button to tune in the desired station. Pressing once for less than a half second changes the frequency by one step. Pressing longer sequentially scans frequencies in the indicated direction. Releasing the button while scanning activates the auto tuning function, which

automatically scans the frequencies until a station is detected, at which point the TUNED indicator lights in the display and auto tuning stops.

5. If FM or CATV is selected, press the MODE button to select the desired audio mode (mono or stereo).
6. Adjust the sound volume with the VOLUME control. If necessary, adjust the tone controls (BASS/TREBLE).

MODE button operation

When the "AUTO" indicator is lit, stereo broadcasts are automatically received in stereo and the "STEREO" indicator lights. To switch to mono reception, press the MODE button so that "AUTO" goes out. Operation is the same in CATV mode.

Preset Station Programming

With the CT-29v, you can preset up to 30 AM/FM or CATV stations in any order. You may select the stations manually or use the auto presetting feature.

MANUAL PRESETTING

1. Refer to the previous section to tune in a desired station.
2. Press the MEMO button.
"MEMO" starts blinking in the display. While "MEMO" is still blinking (about 5 seconds), enter a number from 1 to 30 using the number keys.
3. When a number has been properly input, "MEMO" stops blinking and goes out. The station is now stored in the specified preset memory location.
 - When entering a single digit number (for example, 5), either input "05" or just input "5" and wait for a few seconds.
 - If a number other than 1-30 is entered by mistake, that number flashes in the display to indicate that it is invalid, and the display returns to the original channel preset number.
 - If a number is entered that was previously preset with a station, the old station is erased from memory and the new one takes its place.

AUTO PRESETTING

This function scans the frequencies in the selected band and automatically presets up to 30 stations.

1. Set any desired band and frequency.
2. While pressing the MEMO button, press the TUNING/SCAN Up button. Auto memory starts at this point. The current frequency is memorized in preset memory location 1, "CH 1" is displayed and then auto scanning mode commences.
3. "MEMO" blinks in the display.
4. When a receivable station is picked up, scanning stops and the station is played for five seconds. During this period, the following operations are possible:
 - 1) The band can be changed using the FM/AM button (CATV is also possible).
 - 2) The mode can be changed using the MODE button.
 - 3) The station can be skipped by pressing the TUNING/SCAN button.
5. If no button is pressed during this period, the current frequency is preset in memory location CH 2. If the TUNING/SCAN Up button is pressed during this period, the current frequency is skipped and scanning continues.
6. Operation stops automatically when all 30 preset memory positions are filled.
 - To stop the auto preset function in mid-operation, press the 0/CLEAR button or one of the function buttons.

Recalling a preset station

1. Direct selection method using the number buttons.

Select the desired preset station by entering two digits using the number buttons. For preset stations 1-9, enter a "0" before the preset station number ("05", for example). The specified preset station is recalled as soon as the two digits are entered, and the preset channel number appears in the display.
2. Sequential selection method using the TUNING/SCAN button.

Enter the Preset mode by pushing the FREQ/PRESET button or by selecting a preset station as described above.

Press the TUNING/SCAN button to move up or down to the next preset station. You can "fast forward" or "fast reverse" through the preset stations by holding down the Up or Down buttons.

Preset Scan Tuning

1. Press the P.SCAN button. This button is only available on the RH-29V remote control.
2. "PRESET SCAN" blinks in the display and the preset station with the smallest number is selected first. If no stations have been preset, "CH 0" blinks in the display and the unit returns to the previous mode.
3. Preset stations are recalled in sequence (CH 1 → CH 2, etc.) for 5 seconds each. Preset numbers that do not contain stations are skipped.
4. You can fast forward through the preset stations by holding the Up button pressed.

When the desired preset station is received, cancel the preset scan operation by pressing the P.SCAN button again, the FREQ/PRESET button or the 0/CLEAR button.

Clearing preset stations

You can remove preset stations from memory using the following procedure:

1. Recall the preset number you want to clear.
2. Press the MEMO button. "MEMO" blinks in the display for 5 seconds. While "MEMO" is still blinking, press the 0/CLEAR button. "CLEAR" appears in the display to indicate that the specified preset number has been cleared.

Recording

The CT-29v makes recording audio or video programs easy. Because the input source being recorded can be selected independently from the input source playing over your main room speakers, you can make recordings from one source while listening to another.

For example, you can record an LD to VCR1 (or a CD to DCC) while you're listening to your favorite radio station.

⚡ **Note:** The Multi-room output is the same as the recording source. Do not change the Multi-room source while recording.

Copying Audio to TAPE or DCC

Select the source from which you wish to make the copy on the MULTI ROOM/RECORD SELECTOR buttons. The signal from this source will appear at both the TAPE OUT and DCC OUT jacks, so that the recording can be made on one or both components connected here.

Remember, these are audio ONLY signals being recorded from the source to TAPE or DCC. If you select LD from the MULTI ROOM/RECORD SELECTOR buttons, you will be recording only the soundtrack from that Laser Disc to TAPE or DCC.

This function is independent of the source you have selected to play over your main room speakers. This recording can take place while you are listening to any of the available input sources.

Follow these steps to record to tape.

1. Set the VOLUME control to the MINimum position.
2. Press the POWER switch on the CT-29v to turn on the power.
3. Select the desired source from the MULTI ROOM/RECORD SELECTOR buttons.
4. Turn on the source component and prepare it for playback.
5. Turn on the tape deck that is connected to the CT-29v TAPE OUT or DCC OUT jacks. Prepare it for recording by placing it into record standby mode (record pause).
6. Begin playback of the source component and adjust the record level on the tape deck for optimum recording (refer to the

tape deck's owner's manual for information on setting recording levels). Note that the master VOLUME control on the CT-29v has no effect on the signal at the TAPE OUT jacks.

7. Reset the source component to the beginning of the playback program. Push PLAY on the source component and RECORD on the tape deck to begin recording.
8. You may select a different audio source with the INPUT SELECTOR buttons to playback over your main room speakers while the recording is taking place.

Copying Video to VCR1 or VCR2

The video signal that appears at the VCR1 OUT and VCR2 OUT jacks is determined by the Main INPUT SELECTOR buttons, according to the following chart.

<u>VISUAL</u> <u>(in display)</u>	<u>VCR1 OUT</u>	<u>VCR2 OUT</u>
LD	LD	LD
VCR1	OFF	VCR1
VCR2	VCR2	OFF

If LD appears as the VISUAL source in the display, its signal appears at both VCR OUTPUT jacks. If VCR1 appears as the VISUAL source, its signal appears at VCR2 OUTPUT jacks (VCR1 OUT is disabled). If VCR2 appears as the VISUAL source, its signal appears at VCR1 OUTPUT jacks (VCR2 OUT is disabled).

Because the VISUAL source can be selected independently from the Audio source, you can proceed with the recording of your video program while listening to an audio program over your speakers.

Follow these steps to record to videotape.

1. Set the VOLUME control to the MINimum position.
2. Press the POWER switch on the CT-29v to turn on the power.
3. Select the desired Video Source from both sets of INPUT SELECT buttons (INPUT and MULTI ROOM/RECORD).
4. Turn on the source component and prepare it for playback.

5. Turn on the VCR that is connected to the CT-29v VCR1 or VCR2 OUT jacks. Prepare it for recording by placing it into record standby mode (record pause).
- ⚡ **Note:** If the source component is connected to the RCA video input jacks, then the VCR must be connected to the RCA video output jacks. Likewise, if the source component is connected to the S-VIDEO input jack, then the VCR must be connected to the S-VIDEO output jack.
6. Begin playback of the source component and adjust the record level on the VCR for optimum recording (refer to the VCR's owner's manual for information on setting recording levels). Note that the master VOLUME control on the CT-29v has no effect on the signal at the VCR AUDIO OUT jacks.
7. Reset the source component to the beginning of the playback program. Push PLAY on the source component and RECORD on the tape deck to begin recording.
8. You may now select a different audio source with the INPUT SELECTOR buttons to playback over your speakers while the videotape recording is taking place. BE SURE you only select an audio source (CATV, FM/AM, PHONO, CD, TAPE or DCC). If you select a video source (LD, VCR1 or VCR2), then the audio portion of your recording will change.

7. Remote Control

RC-5 Remote Control Bus

The CT-29v can relay remote control commands to, or be controlled by, any components equipped for RC-5 operation. (Refer to the individual component's owner's manual to see if the unit is compatible with these bus standards.) To connect components to the remote bus, connect the REMOTE CONT. OUT jack on the rear panel of the CT-29v to another component's remote control IN jack using a normal RCA patch cord. Connect the REMOTE CONT. IN jack to another component's remote OUT jack. Any number of components may be "daisy chained" in this manner; the connection sequence is not important. If a connected component has an INT/EXT switch next to the remote jack, switch it to the EXT position.

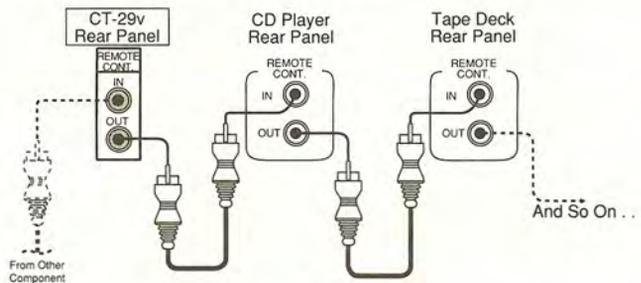


Figure 6. RC-5 Connection example

RH-29V Handheld Remote Transmitter

Batteries

The RH-29V wireless infrared remote transmitter requires two AAA batteries. Remove the battery compartment door on the back of the remote control by pressing in the direction of the arrow. Insert the batteries supplied, making sure to match the positive (+) and negative (-) ends with the diagram inside the battery compartment.

The remote control unit will work in a range of approximately 20 feet in front of and about 30 degrees to either side of the CT-29v.

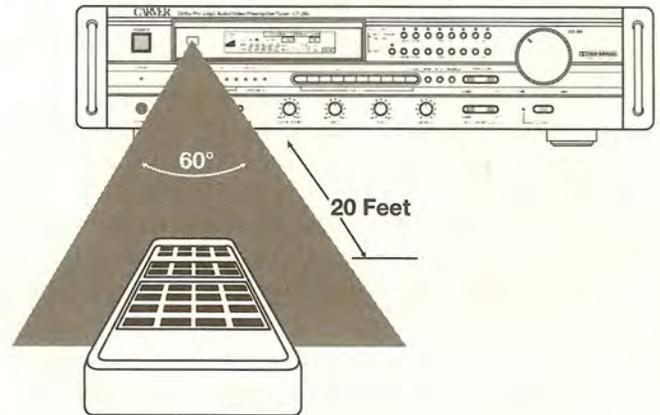


Figure 7. Remote Control Operating Distance and Angle

If the remote control begins to occasionally not respond, 1) check its batteries; 2) make sure the infrared projection area on its tip is clean; 3) check that the CT-29v infrared remote sensor window is not dirty or blocked from direct line-of-sight with the remote.

If you choose not to use the CT-29v's remote, be sure to remove the batteries to prevent corrosion damage from leaking batteries.

RH-29V Remote Control Operation

The RH-29V is a "learning" remote; that is, it can be programmed to operate any component in your system. Each button is pre-programmed with standard RC-5 codes. If your components are RC-5 compatible, just leave the RH-29V Mode Select Switch set to the RC-5 position and it can operate every component in your A/V system through the RC-5 bus. However, if you have one or more components that have a remote control but are not RC-5 compatible, the RH-29V can "learn" the remote control commands from each individual component's remote control. See *Learning Procedure* on page 31.

If you have used the Learning Procedure to program different remote commands into the RH-29V, set the Mode Select Switch to the USER position. Buttons that have not been programmed with new remote control codes will still transmit RC-5 codes in the USER mode.

Some of the remote control's functions are duplicates of CT-29v front panel functions. These are indicated by white circles with black numbers on the remote control diagram. Functions that are unique to the remote control are indicated by dark circles with white letters.

1. Mode Select Switch

Use to select the desired mode of operation: RC-5, USER or LEARN.

2. System Select Switches

These switches select the component that is to be controlled. Position both switches so that they each correspond to the component you wish to address.

3. M-POWER (M-RECALL)

Pressing this button puts the CT-29v into STANDBY mode, and causes the STANDBY LED indicator to light on the front panel. Pressing it again turns the CT-29v back on and the indicator LED turns off.

Note: This function will not work unless the POWER switch on the front panel is pushed in.

This button is also used to erase a learned command from a button position and return it to its original RC-5 function.

4. VCR1/TAPE

These buttons operate a Video Cassette Recorder if VCR1 is selected, or a Cassette Tape Deck if TAPE is selected.

VCR1

This button turns the power to the VCR on and off.

VCR1/TV (A DECK)

When VCR1 is selected, this button operates the TV/VIDEO function of the VCR. When TAPE is selected, this button selects tape A (if using a dual-cassette deck).

CH (DECK B)

When VCR1 is selected, this button decreases the channel selector. When TAPE is selected, this button selects tape B (if using a dual-cassette deck).

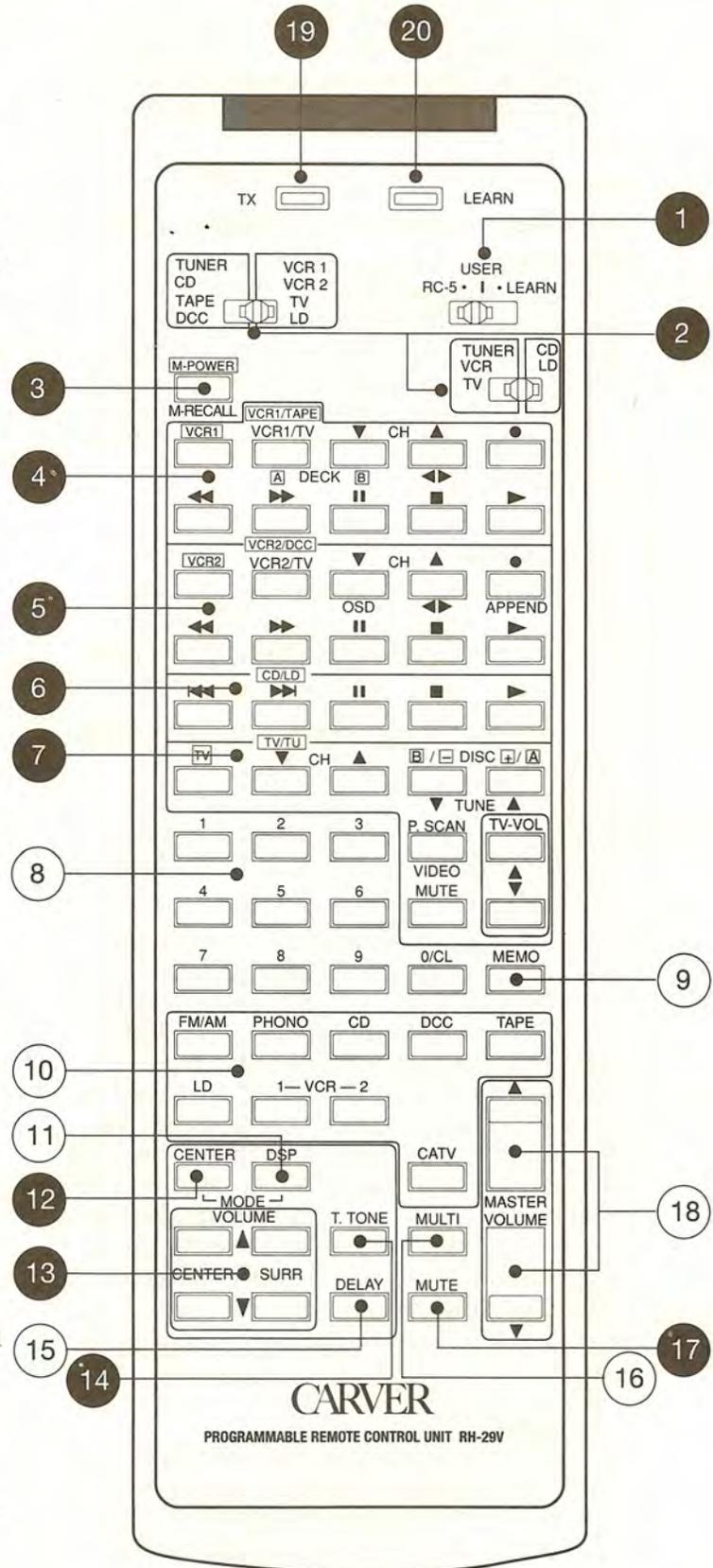


Figure 8. Remote Control Front View

CH ▲ (◀▶)

When VCR1 is selected, this button increases the channel selector. When TAPE is selected, this button changes the direction of the tape (if using an auto-reverse deck).

Record (●), Rewind (◀◀), Fast-Forward (▶▶), Pause (⏸), Stop (■) and Play (▶) buttons

These buttons will control the common functions of the VCR1 or TAPE deck selected. To use the Record button, hold down the Record button and then press the Pause button. (This is a safety feature to avoid accidentally initiating the Record function.)

5. VCR2/DCC

These buttons operate a Video Cassette Recorder if VCR2 is selected, or a Digital Compact Cassette deck if DCC is selected.

VCR2

This button turns the power to the VCR on and off.

VCR2/TV

When VCR2 is selected, this button operates the TV/VIDEO function of the VCR.

CH ▼ (OSD)

When VCR2 is selected, this button decreases the channel selector. When TUNER, CD, TAPE, or DCC are selected, this button will activate the ON-SCREEN DISPLAY function and all the current settings of the CT-29v will be displayed in your TV screen for 10 seconds, right over the top of the picture. Anytime a function or setting is changed, the display menu for that particular action will be displayed in the screen for 10 seconds. Pressing the button again will turn the ON-SCREEN DISPLAY function off.

See *On-Screen Display* on page 19 for more information regarding its operation.

CH ▲ (◀▶)

When VCR2 is selected, this button increases the channel selector. When DCC is selected, this button changes the direction of the tape (if using an auto-reverse deck).

Record ● (APPEND), Rewind (◀◀), Fast-Forward (▶▶), Pause (⏸), Stop (■) and Play (▶) buttons

These buttons will control the common functions of the VCR2 or DCC deck selected. To use the Record/Append button, hold down the Record/APPEND button and then press the Pause button. (This is a safety feature to avoid accidentally initiating the Record/Append function.)

6. CD/LD

These buttons operate a Compact Disc player if CD is selected, or a Laser Disc player if LD is selected.

Previous (◀◀), Next (▶▶), Pause (⏸), Stop (■) and Play (▶)

These buttons will control the common functions of the CD or LD deck selected.

7. TV/TU

These buttons operate a Television or Tuner.

TV

This button turns the TV on and off.

▼ CH ▲

When TV is selected, these buttons will increase or decrease the channel selector. When tuner is selected, these buttons will increase or decrease the preset channels of the CT-29v.

DISC / ▼ TUNE ▲

If CD is selected, these buttons will increment or decrement the disc number selection (for a CD changer). If LD is selected, these buttons will select playback of side A or side B. If Tuner is selected, these buttons will increase or decrease the tuner reception frequency of the CT-29v.

P.SCAN (VIDEO)

When TV is selected, this button will operate the video selector. When Tuner is selected, this button initiates Preset Scan in the CT-29v, causing the tuner to play each preset station for about 5 seconds before changing to the next preset station. Press the button again to cancel Preset Scan.

MUTE

This button will mute the sound from the TV.

TV-VOL ⬆️⬆️

Turns the volume of the TV up and down.

8. Number Buttons

These buttons are used for various purposes, including programming and selecting station presets.

The 0/CL button is used to enter a zero. When selecting a station preset from CH 1 to CH 9, entering a zero first will result in faster response. This button can also be used to cancel or clear various functions.

9. MEMO

This button operates the same as the MEMO button on the front panel, and is used to program station presets.

10. Input Selector Buttons

These buttons operate the same as the INPUT SELECTOR buttons on the front panel. They can also be used as MULTI ROOM/RECORD SELECTOR buttons when the MULTI button is pressed first.

11. DSP MODE

Pressing this button selects the DSP mode for the CT-29v. It operates the same as the DSP button on the front panel. (See *About Surround Sound* on page 33 for more information about the DSP modes.)

12. CENTER MODE

This button is unique to the remote control, and is used to select the mode of operation of the center channel. Repeatedly pressing this button will cause the center channel mode selection to alternate in the following order:

In DOLBY SURROUND or MOVIE SURROUND:

PHANTOM → NORMAL → WIDE →

In 3 CH LOGIC:

NORMAL → WIDE →

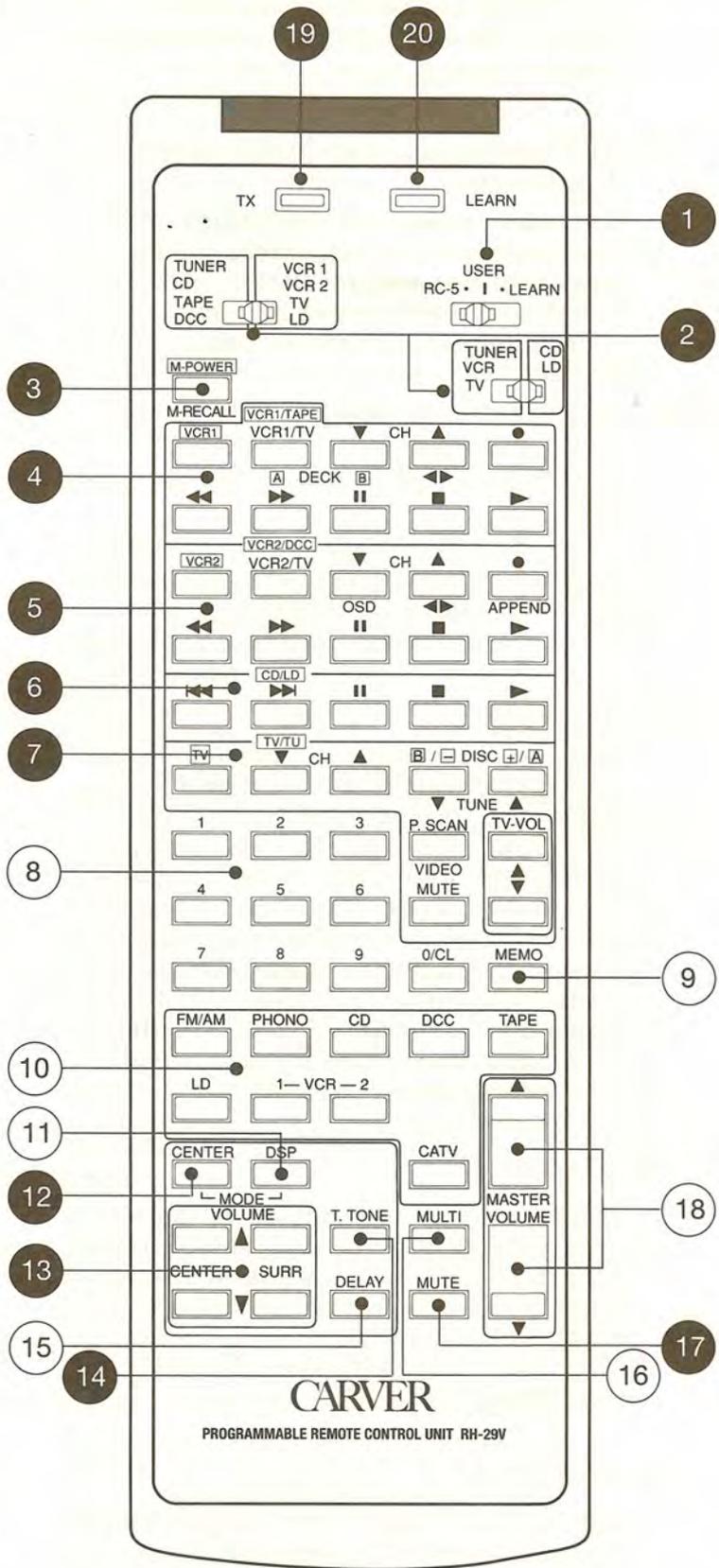


Figure 8. Remote Control Front View

- ⚡ **Note:** The center channel is off when STEREO, HALL1 SURROUND, HALL2 SURROUND and MATRIX SURROUND are selected.

13. SURROUND and CENTER VOLUME Up/Down

These buttons control the volume of the surround and center channels. UP increases the volume and DOWN decreases it. When these buttons are pressed, the relative volume level in dB appears in the display.

- ⚡ **Note:** The Center Volume buttons are only active when in DOLBY SURROUND, MOVIE SURROUND or 3 CH LOGIC mode.

Both the center volume and surround volume levels are memorized and remain at the most recent setting (unless the CT-29v is left unplugged for over a week).

14. T.TONE

This button is unique to the remote control and functions only when DOLBY SURROUND, MOVIE SURROUND and 3 CH LOGIC modes are used. When this button is pressed, a test signal is output to the LEFT, CENTER, RIGHT and (except 3 CH LOGIC mode) SURROUND channels in sequence. This can be used to adjust the relative volume levels between the front, center and (except 3 CH LOGIC mode) surround speakers. See *Surround Sound Level Adjustment* on page 38.

15. DELAY

This button functions for all DSP Surround modes except 3 CH LOGIC (and of course STEREO, which isn't a Surround mode). Pressing this button causes the delay time to increase one step, and operates the same as the DELAY TIME button on the front panel.

16. MULTI

This button is used to turn the Multi-room output ON and OFF, to select the input source for MULTI ROOM/RECORD, and to adjust the MULTI ROOM Volume.

To turn on the Multi-room output, press this button continuously for 5 seconds. ON will appear in the display.

To select an input source for the Multi-room output, press and release the button once. MULTI will appear in the display, and the indicating LED above the selected input source will blink for five seconds. During this time, a new input source can be selected using the Input Selector buttons on the remote control. The volume level for the Multi-room output can also be adjusted by using the MASTER VOLUME Up/Down buttons. The relative volume level in dB is shown in the display.

17. MUTE

When this button is pressed, MUTE appears in the display and the volume of the six main outputs is reduced by 50 dB. Pressing this button again returns all outputs to their previous volume levels.

- ⚡ **Note:** This button has no effect on the Multi-room output.

18. MASTER VOLUME Up/Down

These buttons control the main volume. UP increases the volume and DOWN decreases it. The main volume changes the volume of the surround, center and subwoofer channels simultaneously with the front channel volume so that the overall balance between channels remains the same. Operation is the same as the VOLUME control on the front panel.

- ⚡ **Note:** Do not try to manually rotate or impede the rotation of the volume knob while it is being operated from the remote control.

19. TX

This indicator lights when a remote control button is pressed to transmit a remote control signal to the main unit. When this indicator becomes dim, the batteries are exhausted. Replace both batteries with new ones.

20. LEARN

This indicator lights when a button to be programmed is pressed in Learning mode. The light turns off after the signal is received and memorized. For details refer to the *Learning Procedure* section on the next page.

Learning Procedure

The RH-29V remote control unit can "Learn" the remote control code from any other remote control at any button position except for the CT-29V POWER switch (M-POWER). The functions of components that can be controlled through the RC-5 bus need not be learned, since the RH-29V is already pre-programmed with RC-5 codes. But the functions of other components must be learned before they can be controlled from the RH-29V remote control unit. To "teach" the RH-29V the remote control codes of another component, follow the learning procedure described below.

1. Set the Mode Select switch to LEARN.
2. Select the type of component whose functions are to be learned by setting the two System Select switches to the correct positions. For example, to let the RH-29V learn the functions of an LD player, set System Select switch 1 to VCR1/VCR2/TV/LD and set System Select switch 2 to CD/LD.
3. On the RH-29V, press the button corresponding to the function to be learned. For example, if the function to be learned is playback, press the PLAY button under CD/LD operations on the remote control unit. The LEARN indicator will light up.
4. Place the remote control unit of the component with the function to be learned at a distance of about 8 inches (20 cm) from the RH-29V, so that the head (transmitting side) of the former remote control unit points toward the head of the RH-29V.
5. On the remote control unit of the component, press and hold the button of the function to be learned, until the learning indicator of the RH-29V starts to blink and then goes off. The learning operation is complete when the indicator is extinguished.
6. Set the Mode Select switch to USER.

⚠ **Note:** When the system mode switch is in the USER position, the buttons which have not "learned" new functions will transmit RC-5 codes when they are pressed. In the RC-5 position, all buttons output the RC-5 codes. The REC/APPEND button is usually used together with the PAUSE button. However, if the REC/APPEND button has been programmed with a function from another component, pressing the button together with the PAUSE button will not produce the desired results. In this case, the REC/APPEND button should be pressed alone. This will require using caution to avoid unintentional recording.

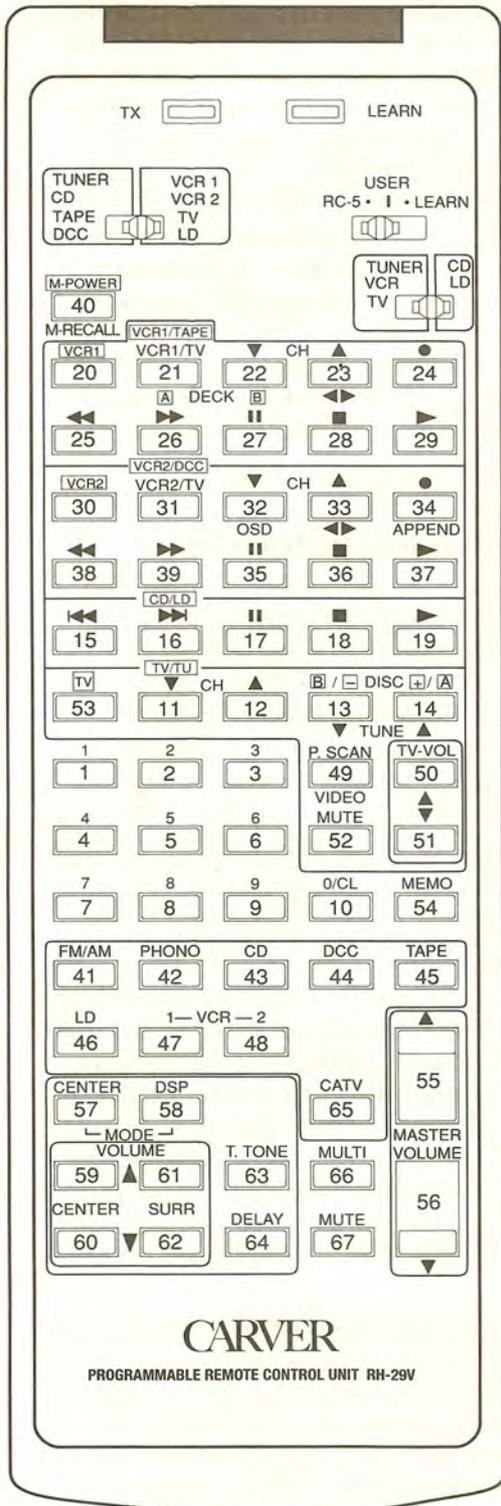
Functions that can be learned

The RH-29V remote control unit includes some buttons which can learn only one remote control function, and some buttons which can learn up to four different functions depending on the System Select switches' combination. For example, the numeric buttons can learn four functions, while the TV POWER button can learn only one function.

The number of functions that can be learned by each button is shown in the table on the next page. In the table, each block indicates one function that can be learned.

Referring to the table, the buttons with the TOTAL programming number of "1" can learn only one function regardless of the System Select switch positions. Therefore, these buttons will always output the same remote control code regardless of the setting of the System Select switches. Other buttons can learn two, three or four remote control codes, determined by the System Select switch positions.

If it is required to always transmit the same remote control code from a button which can learn more than one code, the code must be entered for each System Select switch position. For example, the VCR2 POWER button (No. 30) can learn a total of four remote control codes with the four combinations of the System Select switch positions. If it is required to transmit only the remote control code for the POWER button of VCR2, it should learn the same code four times with the four combinations of the two System Select switches. In this way you can always control the component without worrying about the System Select switch positions.



BUTTON NUMBER	SYSTEM SEL SW - 1	TUNER/CD/TAPE/DCC		VCR1/VCR2/TV/LD		TOTAL
	SYSTEM SEL SW - 2	TU/VCR/TV	CD/LD	TU/VCR/TV	CD/LD	
	BUTTON NAME					
1	1	1	2	3	4	4
2	2	1	2	3	4	4
3	3	1	2	3	4	4
4	4	1	2	3	4	4
5	5	1	2	3	4	4
6	6	1	2	3	4	4
7	7	1	2	3	4	4
8	8	1	2	3	4	4
9	9	1	2	3	4	4
10	0/CL	1	2	3	4	4
11	TV/TU CH▼	1	2	3	4	4
12	TV/TU CH▲	1	2	3	4	4
13	TV/TU [B] / [] DISC	1	2	3	4	4
14	TV/TU DISC [] / [A]	1	2	3	4	4
15	CD/LD ◀◀	1			2	2
16	CD/LD ▶▶	1			2	2
17	CD/LD	1			2	2
18	CD/LD ■	1			2	2
19	CD/LD ▶	1			2	2
20	VCR1/TAPE [VCR1]			1		1
21	VCR1/TAPE VCR1/TV	1			2	2
22	VCR1/TAPE ▼ CH	1			2	2
23	VCR1/TAPE CH ▲	1			2	2
24	VCR1/TAPE ●	1			2	2
25	VCR1/TAPE ◀◀	1			2	2
26	VCR1/TAPE ▶▶	1			2	2
27	VCR1/TAPE	1			2	2
28	VCR1/TAPE ■	1			2	2
29	VCR1/TAPE ▶	1			2	2
30	VCR2/DCC [VCR2]	1	2	3	4	4
31	VCR2/DCC VCR2/TV	1			2	2
32	VCR2/DCC ▼ CH / OSD	1			2	2
33	VCR2/DCC CH ▲ / ◀◀	1			2	2
34	VCR2/DCC ● / APPEND	1			2	2
35	VCR2/DCC	1			2	2
36	VCR2/DCC ■	1			2	2
37	VCR2/DCC ▶	1			2	2
38	VCR2/DCC ◀◀	1		2	3	3
39	VCR2/DCC ▶▶	1		2	3	3
40	M-POWER/M-RECALL			0		0
41	FM/AM			1		1
42	PHONO			1		1
43	CD			1		1
44	DCC			1		1
45	TAPE			1		1
46	LD			1		1
47	VCR1			1		1
48	VCR2			1		1
49	TV/TU P.SCAN/VIDEO	1			2	2
50	TV/TU TV-VOL▲			1		1
51	TV/TU TV-VOL▼			1		1
52	TV/TU MUTE			1		1
53	TV/TU [TV] POWER			1		1
54	MEMO			1		1
55	MASTER VOLUME ▲			1		1
56	MASTER VOLUME ▼			1		1
57	CENTER MODE			1		1
58	DSP MODE			1		1
59	CENTER VOLUME ▲			1		1
60	CENTER VOLUME ▼			1		1
61	SURR VOLUME ▲			1		1
62	SURR VOLUME ▼			1		1
63	T. TONE			1		1
64	DELAY			1		1
65	CATV			1		1
66	MULTI			1		1
67	MUTE			1		1
TOTAL						137

Figure 9. Remote Control Memory Chart

Recalling the RC-5 Preset Code

Even after a button has learned the remote control code of a function, its original preset RC-5 code can be recalled at any time by switching the Mode Select Switch to RC-5. If desired, the programmed code can be cleared by following this procedure.

1. Set the Mode Select switch to LEARN.
2. Simultaneously press the POWER button (CT-29V M-POWER) and the button which has learned a function. The TX indicator and the LEARN indicator will both light.
3. When the TX and LEARN indicators go off, set the Mode Select switch to USER. The RC-5 code has been recalled.

⚡ **Note:** The function that had been programmed into the RH-29V memory has been erased. It will require reprogramming the function in order for the RH-29V to relearn the code.

Button Indications

Although the RH-29V buttons can be used to operate various components, the indications printed above and below the buttons are RC-5 preset code indications. To make it easier to remember which buttons perform which operations, we recommend that you program operations into buttons having the same or similar indications.

Functions that cannot be learned

In the following instances, both the TX and LEARN LEDs blink to indicate that programming cannot be carried out.

1. When the remote control unit's memory is full.
2. When you attempt to program a command from a remote control unit that uses an incompatible transmission format.

8. About Surround Sound

Dolby Pro Logic Surround Sound

The Dolby Pro Logic circuitry in your CT-29v effectively emulates the overall effect of the Dolby Stereo sound heard in movie theaters. It surrounds your listening room with sound, recreates special effects that localize sounds in relation to the viewing screen, and places them to add an extra dimension of reality to the viewing experience.

The first version of Dolby Surround for home was a simplified version with no logic steering and no center channel. Instead, it "passively" decoded the surround channel and created a "phantom" center channel from the left and right front speakers.

Dolby Pro Logic Surround is the second generation in Dolby Surround decoding technology, and features improved spatial articulation and an expanded listening area through use of a true center channel and active logic steering circuitry. The center channel information is derived from the left and right channels and is fed to a separate amplifier and speaker for separation and accurate positioning.

To decode the surround channels, the differences between the front channels are extracted, delayed, and processed by a modified Dolby B-type noise reduction. Essentially, the circuit is a computer which actively breaks down the encoded signals and reassembles them into four separate channels (Left, Right, Center, Surround).

For convenient operation, the CT-29v also contains an automatic balance control to optimize the Pro Logic Adaptive Matrix decoding process. This eliminates the need to adjust the left and right input balance for different programs or sources, an extra step required with some Dolby Pro Logic decoders.

The CT-29v goes one step further by generating ambient and reverberant audio cues in the digital domain, with state-of-the-art DSP (Digital Signal Processing). This provides an accurate, noise-free environment for creating the complex reverberation signals used to simulate the "HALL 1" and "HALL 2" surround modes.

Modes of Operation (DSP MODES)

DOLBY SURROUND

This is the setting you will probably use for watching most Dolby Surround (DOLBY SURROUND) encoded videos. This provides you with left and right stereo for off-screen imaging, a center channel for most on-screen dialogue, and a surround channel for ambience and special effects.

There are three center channel modes available in Dolby Surround. "PHANTOM" should be used if you have elected not to use a center channel. This mode of operation directs the center channel information equally to the left and right channel speakers, creating a "phantom" center image of the dialogue. This is the way the first generation Dolby Surround worked.

"NORMAL" should be used if you are using a small center channel speaker (or speakers) with limited bass response. In NORMAL mode, the lower frequencies (below 100Hz) are removed from the center channel and redirected equally to the left and right speakers. Since bass frequencies are omnidirectional, this will not affect the imaging of the center channel. The dialogue will still appear to come from the video screen.

"WIDE" should be used if you are using a full-range center channel speaker that is just as capable of good bass response as your main left and right speakers. In this mode, all the center channel information remains in the center channel output.

The center channel output is primarily used for the dialogue in movie soundtracks. Use the Vocal Zoom control to adjust the perceived depth of the dialogue in relation to the screen and the front speakers. Turning the Vocal Zoom control clockwise will bring the center channel forward in space, literally "zooming in" on the dialogue. If your center channel speaker is too close to your listening position, it can be distracting and sound unnatural. Turn the Vocal Zoom control counter-clockwise to make the center channel recede. The Vocal Zoom control is disabled when in Phantom mode.

There are four delay times available in Dolby Surround: 15, 20, 25 and 30mS (milliseconds). This is the amount of time the surround information output to your rear

speakers is delayed from the front and center channels. The reason for this delay is to allow the front channel information to reach your ears first. This is required because of a psychoacoustical phenomenon known as the "Haas effect". It has been shown that our ears tell us that sound is coming from the direction in which it arrives at our ears first. Delaying the rear channels 15 to 30mS assures that our ears will hear the front channels first, maintaining a correct directional image. Sound travels at the rate of about 1 foot per millisecond, so the minimum number of milliseconds of delay you should use can be calculated with the following formula:

$$D_F - D_S + 15 = \text{Delay in milliseconds}$$

Where:

D_F = Distance from listening position to Front speakers (in feet)

D_S = Distance from listening position to Surround speakers (in feet)

You can experiment with the delay settings to find the one that works best for your particular speaker and listening positions.

MOVIE SURROUND

Movie Surround provides stereo left and right, center and surround channel outputs, but furnishes additional delay times for the SURROUND (rear) channel output. This mode allows you to select from 0mS to 90ms delay times, in 10mS increments. This may be appropriate in some instances to simulate the spacious sound of a large "movie theater". Again, you should experiment with these settings to find the one most appropriate for your listening room and the particular program you're watching.

3LOGIC (3 Channel Logic)

This mode of operation is available to provide a center channel image for stereo program sources that are not encoded with surround sound. This is useful for watching older movies or TV shows that are recorded in stereo, particularly if your speakers are located relatively far apart from each other. In this way, dialogue will be correctly located at the video screen, while the stereo information will provide off-screen imaging. Only NORMAL and WIDE center channel modes are available in 3 CHANNEL LOGIC mode. Delay time is 0mS because the SURROUND channel is off.

HALL 1 SURROUND

This mode simulates the sound field of a medium-sized concert hall with a circular shape. The DSP circuit takes a L+R mono signal (hall ambience is not perceived in stereo) and creates the rich and complex reverberation signals and sound reflections that would normally occur in a hall this size. The overall delay of the SURROUND channel can be varied from 0mS to 90mS. There is no center channel output in this mode.

HALL 2 SURROUND

This mode simulates the sound of a live concert venue, recreating the feel of a stage performance and the expansiveness of audience seating. As in HALL 1 SURROUND mode, the SURROUND output can be delayed from 0mS to 90mS, and there is no center channel output.

MATRIX SURROUND

This setting produces a natural, spacious sound. In this mode, a delayed stereo difference (L-R) signal is sent to the rear speakers. This setting might be appropriate for listening to sports broadcasts or outdoor concerts. As in the Hall Surround modes, the SURROUND output can be delayed from 0mS to 90mS, and there is no center channel output.

STEREO

STEREO is not a surround mode. All surround sound circuitry is off in STEREO mode, and it allows you to listen to the stereo signal as it was recorded, without any processing.

AUTO DSP

When the AUTO DSP function is activated, the CT-29v will memorize the most recent DSP settings for each of the three video inputs (LD, VCR1 and VCR2). If an audio input is selected, the DSP mode will automatically switch to STEREO.

DSP MODES	Delay Time Range
DOLBY SURROUND DOLBY SURROUND was designed to be compatible with movies and programs encoded with (DOLBY SURROUND). The CT-29v employs a Dolby Pro Logic Surround decoder that functions in the same way as the decoding found at the heart of Dolby Stereo cinema processors used in movie theaters. The Dolby Pro Logic Surround decoder features a directivity enhancer, which naturally recreates the acoustic image and motions to provide a surround effect just like you would experience in a movie theater.	15 - 30ms Initial setting: 20ms
MOVIE SURROUND This mode allows you to extend the delay time in the rear channel up to 90mS. This enhances the feeling of a larger sound field in the surround channel.	0 - 90ms Initial setting: 20ms
3LOGIC If the left and right speakers are located far apart, the sound field of the center channel is degraded. This mode is used to improve the sound field center by applying directivity enhancement provided by the Dolby Pro Logic Surround decoder.	No delay applicable
HALL 1 SURROUND The rich tones you hear in actual concert halls are a complex combination of direct and reflected sounds. This mode provides a sound field effect of a medium sized circular hall with rich reverberations.	0 - 90ms Initial setting: 30ms
HALL 2 SURROUND This mode is suitable for reproduction of live concerts. It reproduces the feeling of a live stage performance and audience expanse.	0 - 90ms Initial setting: 30ms
MATRIX SURROUND This mode is effective for playing sports broadcasts or outdoor concerts. It provides a surround mode with a full feeling of presence.	0 - 90ms Initial setting: 30ms
STEREO The DSP mode is off in this position, and the sound is reproduced in normal stereo.	No delay applicable

Notes on Delay Time

The "Initial Setting" is the default setting which comes up when the CT-29v is turned on for the first time. These are the recommended settings to start with

for each surround mode. A longer delay time creates a larger sound field, and a shorter delay time creates a smaller sound field.

The delay time can be varied independently in each mode (except 3 Channel LOGIC and STEREO).

If you want to temporarily change a setting (DSP mode, Center Channel mode or Delay Time) for a particular video input source without changing the AUTO setting in memory, simply press the AUTO button to deactivate the AUTO mode. The red indicating LED will go off to show that any changes you make will not be stored in memory. To recall the original settings, press the AUTO button to reactivate the settings that were previously stored in memory.

Speaker Selection and Placement

Front Speakers - These should be full-range, high quality speakers; the best speakers in your system. They should be located far enough from each side of your TV monitor to provide a well defined stereo image. The TV monitor should be located midway between the left and right front speakers.

Surround Speakers - The rear speakers in your surround sound system provide ambient sound for an open, "concert hall" effect when listening to music. They also spread the sound and provide special effects on video soundtracks when used in the Dolby Surround mode.

The demands made on your surround speakers are far less than on your main room speakers. Therefore, these speakers do not need to be as large (and as expensive) as your main room speakers. Deep bass response is not important at all. They should, however, have a smooth midrange and reasonably clean upper midrange. Extended high frequency performance is not critical either,

because the very high frequencies are rolled off above 7kHz. This is to minimize dialogue sibilance crosstalk in the surround channel, and also to create a sense of increased distance between the speakers and the listener. The surround speakers should, however, have wide dispersion. Good 2-way bookshelf speakers will handle the job easily, and most full-range mini-monitors are also quite suitable for this application. Depending on how extensive you want to get with your installation, there are also several in-wall and wall-mount speakers that are suitable for use as surround sound speakers.

The surround channel speakers should be mounted so that their sound is dispersed throughout the viewing area. In a theater, Dolby Stereo Surround is achieved with multiple rear channel speakers spaced along the side walls. To achieve the same effect with just two surround speakers requires a design which can disperse its sound evenly across the listening area. Another approach is to mount the speakers facing upward so that their sound is dispersed by the ceiling and rear wall (see Figure 10).

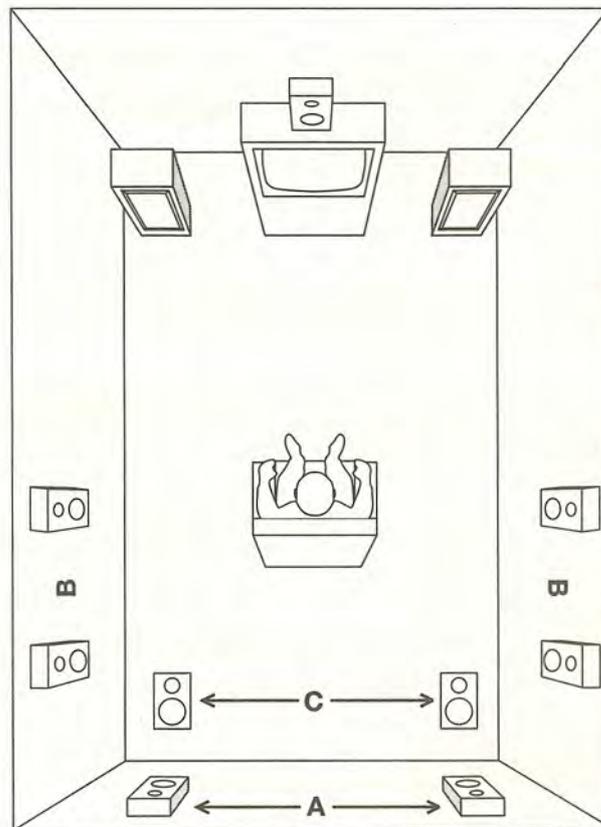


Figure 10. Surround Speaker Options

Option A: Placed or mounted behind listeners
 Option B: Placed or mounted along side walls
 Option C: Placed or mounted facing upward

Center Speaker(s) - Again, the center speaker(s) can be of a smaller size and less expensive than your main speakers. However, the upper mid-range and treble response of the center speaker(s) should resemble that of the main speakers. If there are significant differences in frequency response in this range, the stereo image may shift toward the speaker with the higher output.

You can use one or two speakers for the center channel. If you choose to use two speakers (Figure 11A), the same signal will appear in both speakers

since the CENTER channel output is monophonic. They should be located on each side of your TV monitor, as close as possible so that the dialogue will seem to come from the center of the TV screen. If you choose to use one speaker (Figure 11B), it should be located immediately above or below your video screen.

In either case, the center speaker(s) should be placed as close to your video screen as possible, so it must be magnetically shielded. If it is not shielded, it could cause distortion of the TV picture. Special video-compatible monitor speakers are available for this application.

As another option, many TV monitors have a separate audio input jack (or jacks) that can be used to input an audio signal from an external source, like a VCR or your stereo system. If the speaker in your TV monitor is adequate, you can use these jacks to connect the CENTER AUDIO OUTPUT from the CT-29v directly to your TV monitor (Figure 11C). Just remember to select the external audio input (TV/VIDEO or whatever) on your TV monitor when using Dolby Surround, Movie Surround or 3 Channel Logic modes.

Amplifier Selection

The type of amplifier you choose to power the various speakers in your Surround Sound system will largely depend on the kind of speakers you are using.

For the front speakers, you will want to use a stereo amplifier with enough power to accommodate the maximum power rating of the speakers you have chosen for your main stereo reproduction. Avoid skimping on amplifier power for the front speakers. If you use an amplifier that is rated less than half of the maximum power rating of the speakers, then you will not benefit from the full potential of your speakers. You also run the danger of driving the amplifier to its maximum capacity in an attempt to try and reach the full potential of the speakers, which will produce "clipping" in the amplifier, a lethal condition for loudspeaker drivers.

The same formula holds true for the amplifier you use to drive your surround speakers. The amplifier should have enough power to reach the maximum power rating of all the surround speakers you are using. Although in DOLBY SURROUND the surround channel is in mono, you should use a stereo amplifier because, in HALL 1 and HALL 2 SURROUND modes, the Left and Right Surround outputs are different.

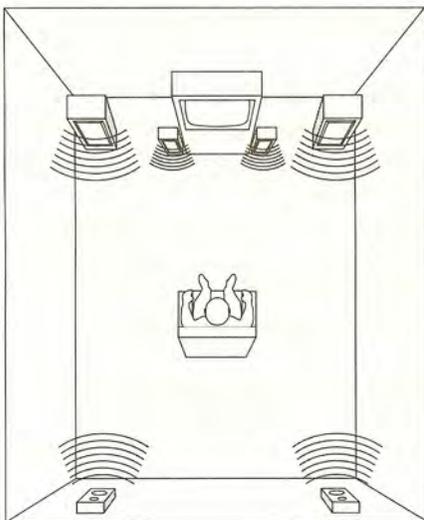


Figure 11A.

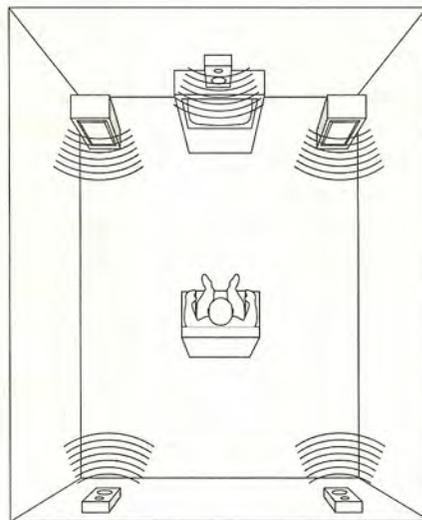


Figure 11B.

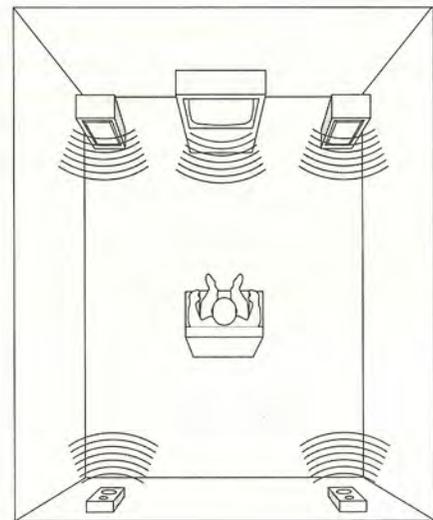


Figure 11C.

Figure 11. Center Speaker Options

- Option A: Using two speakers
- Option B: Using one speaker
- Option C: Using speaker in TV

If you connect more than one speaker to each amplifier channel output, be sure you stay within the bounds of the manufacturer's recommended minimum impedance for the amplifier (refer to the amplifier's owner's manual for this information).

Depending on how you choose to set up your system, you may not require a separate amplifier for the center channel output. If your TV monitor has audio input jacks, you can connect the center channel audio output from the CT-29v directly to the TV, and use the combined audio amplifier and speaker(s) in the TV for the center channel.

You may choose not to use a center channel speaker at all, and simply use the PHANTOM mode for the center channel.

If you use a separate single center channel speaker, you might consider using a 3-channel amplifier to power both the surround speakers and the center speaker.

Finally, you may want to use a separate mono or stereo amplifier to drive your center channel speaker(s). Again, choose an amplifier that can supply enough power to meet the maximum recommended power of the loudspeakers you are using.

Remember your Carver Dealer is available to assist you with recommendations for your specific application.

⚡ **Note:** If you are starting from scratch, we recommend that you choose your loudspeakers first, and then choose the amplifiers to match the speakers. If you already have the amplifiers and are choosing loudspeakers last, don't be too concerned about selecting loudspeakers that fall below the maximum power capability of your amplifiers. It is better to have an amplifier with more than enough power than not enough power.

Surround Sound Level Adjustment

This procedure adjusts the relative levels of your front, center and rear speakers for the best balance in your listening environment. It need not be repeated before each use of Dolby Surround if you do not change the levels.

1. Turn your sound system on and turn the VOLUME control on the CT-29v all the way down.
2. Press the DSP MODE button until DOLBY SURROUND is selected.
3. Press CENTER MODE on the remote control to select the desired center channel mode of operation.
4. Press T.TONE on the remote control. TEST will appear in the display. Slowly increase the VOLUME control and you will hear a test tone in the left, center, right and rear speakers in sequence. Adjust the VOLUME control for a comfortable listening level from the left and right speakers.
5. Sit in the viewing area and, using the remote control's CENTER and SURROUND VOLUME buttons, adjust the sound volume so that the sound appears to be the same level from all speakers. This presets the levels for average use conditions, so it is likely only small adjustments will be necessary after completing this procedure to fine tune the system for specific programs.
If you have an asymmetrical loudspeaker arrangement, where one speaker is further from your listening position than another, you may adjust the CT-29v BALANCE control to assist in arriving at a balanced sound. Another option is to adjust the amplifier's level controls (if available) to balance the sound at the listening position.
6. When adjustment is complete, press the T.TONE button again to stop the test signal.

⚡ **Note:** You may wish to note the Center and Surround volume levels on the front panel display (or the ON-SCREEN DISPLAY) when you complete your adjustment procedure. If you should change this adjustment when using other surround modes, you can reset it to optimum Dolby Surround level without repeating the test tone procedure.

9. Multi-Room Operation

The Multi-room feature of the CT-29v allows you to listen to music in another room. Multi-room functions are independent of main room functions, so you can listen to a different audio or video source even when the main room system is in use. All you need to extend your sound system into another room is a stereo power amplifier and another pair of speakers. Simply connect the MULTI OUT jacks on the back of the CT-29v to the input jacks of the power amplifier for your additional room. It is preferable to keep your amplifier near your main system, and run the speaker wires from the amplifier to the additional room where the speakers are located.

With this basic set-up, the Multi-room functions are controlled from the main room. For more flexibility, the CT-29v has a Multi-room remote control feature that allows you to control audio source selection, volume and start/stop commands for CD and tape from another room in your home. All you need to enable remote control from the other room is the Carver IR-R7 Multi-room Infrared Receiver.

IR-R7 Multi-Room Infrared Receiver

The IR-R7 can be used in one of two ways. As a Multi-room receiver it connects to the single MULTI ROOM jack on the back of the CT-29v. The IR-R7 receives infrared commands from its RH-89A "credit card" sized remote transmitter and relays them to the CT-29v over a coaxial connecting cable. In addition to the IR receptor, it has an indicator LED which is lit when the Multi-room function is ON, and blinks when receiving a command from the remote control unit.

As a Remote Infrared Receiver it connects to the REMOTE CONT. IN jack on the back of the CT-29v. In this way it acts as an extension of the Remote Sensor in the front panel of the CT-29v. It will convey any infrared command from any remote control to the CT-29v. Note that to be operated in this way, the IR-R7 requires a (supplied) external DC power source that plugs into an AC wall outlet.

Additional instructions on installation and operation are included with the IR-R7 which is available separately from your Carver dealer.

Simultaneous Operation of Multi-Room and Surround Sound

The Multi-room function is not affected by the activation of a Surround Sound mode. The signal that comes from the Multi-room output jacks is taken before any Surround Sound or DSP processing, and the Multi-room operates as if it is always set to STEREO mode.

10. In Case of Difficulty

If you're having trouble or suspect a problem with the CT-29v, try some simple troubleshooting before contacting your Carver dealer or an Authorized Carver Service Center. Most likely, the problem lies elsewhere in the system or with a button or control inadvertently left in the wrong position.

No Sound, No Power

1. CT-29v power is off.
2. CT-29v is plugged into a switched convenience outlet. Verify outlet is live.
3. Linecord is disconnected.
4. Poor fit between the plug and wall receptacle.
5. Power off at wall receptacle (check with tester or lamp).

No Sound, Power On

1. Inactive source is selected.
2. MUTE is activated.
3. VOLUME control is turned down on CT-29v or on power amplifier.
4. Speaker cables not connected properly to amplifier.

Sound is very faint, even with volume control all the way up

1. Inactive input is selected.
2. CD player or other sound source with independent volume control is turned down.
3. Power amplifier input level control turned down.

No Sound in one Channel

1. Defective or loose connection cable. Swap with a known good cable to locate the bad one.
2. Speaker wire loose or disconnected.
3. Balance control set fully left or right.
4. Speaker fuse blown.
5. Power amplifier malfunctioning.

Loud howl, squeal or whistle

1. TAPE is engaged while microphones are connected to tape deck for recording.

Solo voices or instruments sound thin, shrill or distorted

1. Treble control set to maximum boost.
2. Phono cartridge wired out of phase.
3. Speakers are connected out of phase.

No sound when AM or FM is selected

1. No AM loop antenna has been connected.
2. No FM dipole or external antenna has been connected.

No picture from TV monitor

1. Correct VIDEO input has not been selected.
2. Video component is not turned on.
3. Video component has been connected incorrectly.

No Sound from Rear Channels

1. Rear volume control on CT-29v is turned down.
2. Videotape does not have surround sound effects. Try HALL 1, HALL 2 or MATRIX SURROUND mode to confirm that the rear channels are working.
3. VCR operating in mono. Check VCR instructions for stereo playback.

No Sound from Center Channel

1. DOLBY SURROUND (MOVIE SURROUND or 3 CH LOGIC) has not been selected.
2. Center Mode is set to PHANTOM.
3. Center volume control on CT-29v is turned down.

11. Specifications

Hum and Constant Noise

1. Defective or loose signal cables.
2. Improper fit between signal cable plugs and sockets.
3. Signal cables have been routed too closely to AC cables, power transformers or motors.

Fluctuation of On-Screen Display characters.

With some video components or programs, on-screen display characters may be unstable due to noise or tracking error.

1. Adjust the tracking control of the VCR or the fine tuning control of the TV for best results.

○ If the video signal being received is very noisy, or if the input level is low, the background of the On-Screen Display characters may turn to blue.

Remote Control Won't Work

1. Batteries are dead or missing.
2. Remote is too far from or at too much of an angle from the remote sensor window on the CT-29v.
3. Remote transmitter or the remote sensor window on the CT-29v is dirty.

FM Tuner Section

Tuning Frequency Range:	87.5-108 MHz
Frequency Stepping:	50kHz
Antenna Terminal:	75 ohm coaxial input
IHF Usable Sensitivity:	
Mono:	13.5 dBf (1.3 μ V)
Stereo:	23.0 dBf (3.9 μ V)
Sensitivity for 50dB Quieting:	
Mono:	16.8 dBf (1.9 μ V)
Stereo:	39.2 dBf (25 μ V)
S/N Ratio at 65 dBf input (A-weighted):	
Mono:	76 dB
Stereo:	68dB
Image Rejection:	98 MHz, 50 dB
IF Rejection:	70 dB
THD (65 dBf at 100% Mod):	
Mono:	0.2%
Stereo:	0.5%
Stereo Separation (65 dBf @ 1kHz - Wide):	40 dB
Frequency Response (at 65 dBf):	10Hz to 15kHz (+/-1dB)
De-emphasis:	75 μ S (USA), 50 μ S (Export)
Tape Output Level (75kHz deviation):	940 mV rms

AM Tuner Section

Tuning Frequency Range:	520-1710 kHz
Frequency Stepping:	10kHz (USA), 9kHz (Export)
Sensitivity (20dB Quieting)	
Loop:	500 μ V
THD (5mV/m at 30% Mod):	0.5%
Selectivity (S/N 20dB @ \pm 10kHz):	25 dB
Image Rejection:	40 dB
IF Rejection:	60 dB
S/N Ratio (A-weighted) referenced to 5000 μ V/50 ohm input:	50 dB

Preamplifier Section**Frequency Response:**

Phono: RIAA ± 0.5 dB, 20Hz to 20kHz

Line Level Inputs: ± 0.5 dB; 20Hz to 20kHz

Subwoofer Output: ± 3 dB; 10Hz to 80Hz

Surround Output (Dolby Surround): +0, -3dB; 100Hz to 6kHz

Channel Balance: ± 1.5 dB

Signal-to-noise ratio (IHF A-weighted):

Phono: >78 dB
(at Tape Out, below an input reference of 5mV rms at 1kHz)

All other line level outputs: >85 dB

Crosstalk (@ 1kHz): >70 dB

Input Sensitivity (for 0.5Vrms Out with Master

Volume fully CW):

Phono: 1.0 mV

Line: 57 mV

Input Impedance:

Phono: 47 kilohms

All other line level inputs: 50 kilohms

Maximum Input Level:

Phono: 80 mV rms

Line: 5.0 V rms

Output Impedance:

600 ohms

Maximum Output Level:

Line (Front): 7V rms into 100 kilohms

Headphone: 2.4V rms into 60 ohms
(96mW)

6.6V rms into 600 ohms
(73mW)

Stereo Separation:

>65 dB at 1kHz

Tone Controls

Treble: ± 10 dB @ 10kHz (± 1 dB)

Bass: ± 10 dB @ 100Hz (± 1 dB)

Vocal Zoom: ± 5 dB @ 2kHz (± 1 dB)

Loudness (Master Volume at 9:00):
+5 dB @ 100Hz (± 1 dB)

Subwoofer: 80Hz (18dB/octave)

Video Section

Input/Output Level: 1V p-p

Input/Output Impedance: 75 ohms

S/N Ratio: 65 dB

On-Screen Display: NTSC standard
(USA/Canada)

General**Power Requirements:**

120VAC/60Hz USA and Canada
(Other voltages available for export)

Power Consumption:

36W

Dimensions (H x W x D):

4.4" x 19" x 15" (including handles)
112mm x 483mm x 381mm

Net Weight:

11.3 lbs. (5.1 kgs)

Shipping Weight:

15.7 lbs. (7.1 kgs)

Carver constantly strives to incorporate new methods, materials, and technologies in order to further improve the quality of our products. Thus all specifications are subject to change without notice.

12. Care and Service Assistance

Care

You'll want to wipe off the CT-29v's front panel and chassis from time-to-time with a soft, dry cloth. If you have something stubborn to remove, use a mild dish soap or detergent sparingly applied to a soft cloth. Don't use alcohol, ammonia, or other strong solvents.

Service Assistance

We suggest that you read the LIMITED WARRANTY completely to fully understand your warranty/service coverage. Please promptly complete and return the WARRANTY REGISTRATION CARD. Also be sure to save the sales receipt in a safe place. It will be necessary for warranty service.

If your CARVER product should require service, we suggest you contact the Dealer from whom you purchased your unit. Should the Dealer be unable to take care of your needs, you may contact the CARVER Technical Service Department by phoning (206) 775-6245 or by writing to us at the Factory address shown at the right. We will then direct you to the nearest in our national network of Authorized Warranty Service Centers or give you detailed instructions on how to return the product to us for prompt action.

If you should have questions or comments, please write to the Factory address given below. Please include the model and serial number of your Carver product, your complete address and a daytime phone number.

Factory Address

Carver Corporation Service Department
P.O. Box 1237
Lynnwood, WA 98046-1237

(206) 775-6245	<i>Customer Service and Technical Information</i>
(206) 778-0509	<i>Repair Information</i>
(206) 775-9180	<i>Customer Service Fax</i>
(206) 775-1202	<i>Main Office, General Business</i>
(206) 778-9453	<i>Main Office Fax</i>

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Part #990-20191-00
Rev. A

Written and designed in U.S.A.
Printed in Japan.

CARVER

Powerful • Musical • Accurate