CARVER

C-5 Dual-Zone Preamplifier

Owner's Manual

CARVER

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 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.

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 de-

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.

scribed in this operating manual. All other servicing should be referred to qualified service personnel.

15. 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 préevenir les chocs électriques ne pas utiliser cette fiche polariseé 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 pariie à découvert.

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

17. 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.

18. 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 las 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.

STOP!
PLEASE READ THIS!

Key Points Are Highlighted in Boxes.

Ultra-important information about hooking up and operating your C-5 is enclosed in boxes like this one. If you're an experienced hi-fi buff and don't usually read manuals all the way through (or are just super-impatient), at least read all the info in the boxes throughout this manual. The C-5 has some unique features which are not immediately obvious.

A MESSAGE FROM BOB CARVER

Congratulations on purchasing one of the most remarkable preamplifiers ever offered. A design that combines excellent overall sonic qualities, useful features and Carver exclusive technology in an ultra-slim line configuration.

The basics

First and foremost, the C-5 is a superb preamplifier with moving magnet phono stage and inputs for up to eight sound sources (six regular inputs plus two tape monitor loops). Distortion and noise are exceptionally low. Dynamic headroom is high enough to handle the most aggressively-recorded CD or LaserDisc. Moreover, we think that you'll be impressed with the C-5's overall "sound", a subjective quality that otherwise defies quantification.

Sonic Holography®

Next, we have incorporated a Sonic Hologram Generator into the C-5. Sonic Holography® is an exclusive Carver invention which helps restore the true spacial characteristics of recordings. It can bring you an actual improvement in the quality of listening via complex processing of the stereo signals, and a change in relationships between the listener and loudspeakers. Now, instead of flat, between-the-loudspeaker imaging associated with conventional stereo, Sonic Holography® will paint a sonic picture that's remarkably believable and convincing. You'll experience a perceptible increase in sound stage depth as well as width. It works with any stereo input including CD's, tapes, records, FM broadcasts, VHS Hi-Fi video soundtracks, etc., and does not require additional speakers. It DOES, however, require careful set-up and speaker placement. In other words, you'll have to take some time and read the instructions carefully to fine tune Sonic Holography® to your room and speakers. . . but the results can be absolutely astonishing. We get many letters from Carver owners who simply "cannot live without" the improvements Sonic Holography® makes on their favorite music.

Remote control

That may not seem like such a big deal, but. . . 1) this is Carver's first remote control preamplifier and 2) there are actually very few remote preamps offered by any manufacturer. Please note that we have chosen to use a motorized volume control rather than internal gain reduction circuitry. By motorizing what is essentially a standard, low-distortion potentiometer such as the type used in our Reference Preamplifiers, we can eliminate considerable circuitry which can affect the signal. Besides, with the lighted inset, the motorized volume control looks absolutely cool in a darkened room.

Different music in different rooms

The C-5 is a dual-zone preamplifier. That means two different sources can be played simultaneously in different parts of your home. All you add is a second power amplifier and extra speakers. For example, along with your main listening room, you could enjoy music in your bedroom, den, patio or rec room. Volume and source selection for both "zones" can be controlled from the C-5's remote.

Made where?

Carver is American-owned and based in Lynnwood, Washington. Of the almost 300 people who work here, most are engaged in building Carver home, mobile and professional audio products. Carver's goal is and always will be to provide audiophile-quality products at affordable prices. Thus, we strive to take advantage of manufacturing economies and methods wherever possible. As a result, we DO use outside production facilities for some products and take great pains to indicate this on your packing box, but some people are still surprised. Suffice it to say that the C-5 is American-designed and American-engineered and is the great value it is because we have chosen the most effective production source for the particular model.

About this manual

In response to Carver customer suggestions, we're trying a new style of manual. It is designed to cover more possible hook-ups and better ex-

plain the operation of the C-5. As a result, it may appear considerably more complicated than the manual which comes with some preamplifiers. If you're not experienced in hooking up stereo equipment, we think that you will appreciate the detail to which we have gone. However, we've also provided a method by which the "advanced" user can quickly grasp the key points and differences of the C-5. Important information is enclosed in boxes like the one on the next page. Even if you don't read any other part of the manual, please check out each of these boxes before proceeding.

Once again, thank you!

There are a bewildering number of preamplifier brands and models on the market today. We appreciate your choice of the C-5. Its small size belies the wealth of features and great sound that it is capable of. I hope that you will have many years of listening enjoyment.

Sincerely,

Bob Carver

Hook-Up

Save the packing box and your sales invoice!

The box is necessary for re-packing your C-5 if it ever needs service (or if you move).

Keep the sales receipt from the store where you bought your C-5 1) to establish the duration of your Warranty; 2) for insurance purposes.

Upon opening the box, please check for any visible sign of damage that did not appear on the outside of the box. If you DO encounter what appears to be concealed damage, please consult your Carver Dealer before further unpacking or installing the unit.

Along with the steps noted above, take a moment and fill in the following information for convenient reference:

Model **C-5 Dual-Zone Preamplifier**

Serial number _____

Purchased at _____

Date of purchase _____

Finally, take a moment to fill out and return the Warranty Card that came with your C-5 Preamplifier.

Placement

The real no-no's are listed on the first page of this manual. They include common sense stuff like "don't use the C-5 in your swimming pool." Assuming your location is OK, the C-5 can be placed in any position including vertically. Heat, at least in normal amounts, shouldn't be any problem. However, be sure not to block the C-5's top panel ventilation areas. If you set another component on top of the C-5, make sure that its "feet" sit squarely on top of the C-5 so that there is at least a 1/4" gap between the component and the C-5.

Also make sure that the C-5 is not placed directly above power amplifiers with high heat output.

Connection tips

We're about to launch into the actual nitty gritty patch cord frenzy that results when you get a new preamplifier. First, though, consider the following tips.

- Turn all components OFF before making any connections.
- 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. This is especially important for phono cables which carry very weak signals. 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 wrapped up with a hook-up cable. Carver components' power cords are on the right side of the chassis (when viewed from the back). This allows you to bundle all the power cords and keep them separate from signal connections.
- Type of hook-up cords. Also called interconnects, patch cords or RCA cables. There are lots of different grades of hook-up cables. You can pay as much as $30 per foot for some of them! Whether or not you get an incremental increase in sound quality with "audiophile" interconnects is up to your own ears. One further comment, though. Really CHEAP connection cables can sometimes DIS-connect themselves inside, causing a loss of sound in one channel or hum problems. Before you send a component in for service, swap hook-up cables to see if they're the culprit.
- DON'T PANIC. While there are no less than 24 sockets on the back of the C-5, matching them up with your existing equipment is simple. Besides, you probably won't use all 24 sockets anyway.

Hook-up...An overview

There are basically two kinds of connections on the C-5 (or any other preamp for that matter): *1-way* and *2-way*.

One-way connections simply route the signal from a sound source to the corresponding input on the back of the C-5.

1-way "incoming" connections are for:

- •CD Player
- •Tuner
- •Video 1 (sound ONLY)
- •Video 2 (sound ONLY)
- •Turntable (PHONO)
- •AUXilary source

1-way "outgoing" connections are:

- •Pre Out (to main system amplifier)
- •Remote Out (to 2nd zone amplifier)

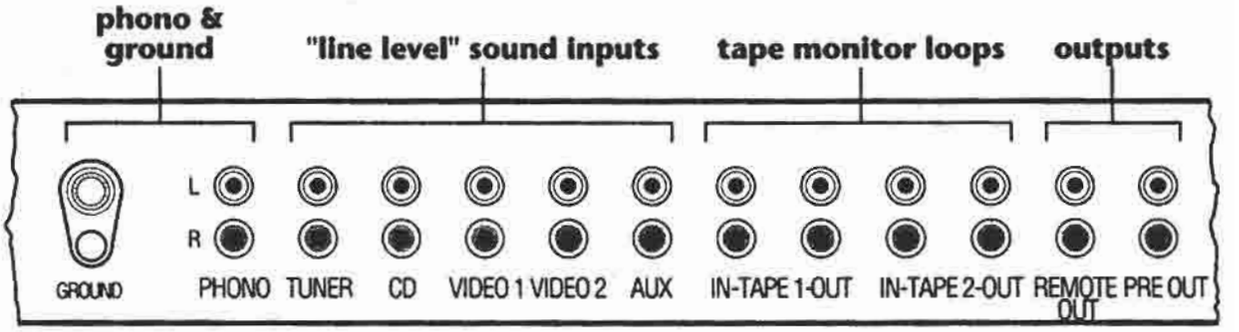
These are easy connections. We discuss a few of them in detail below. All you have to watch is making sure that "lefts go to lefts and rights go to rights."

Two-way connections can get considerably more complicated. They center around the C-5's tape functions and are referred to as tape monitor loops. "Loops" because a signal from the component goes out of the C-5 as well as into it.

2-way connections may involve one or more of the following components:

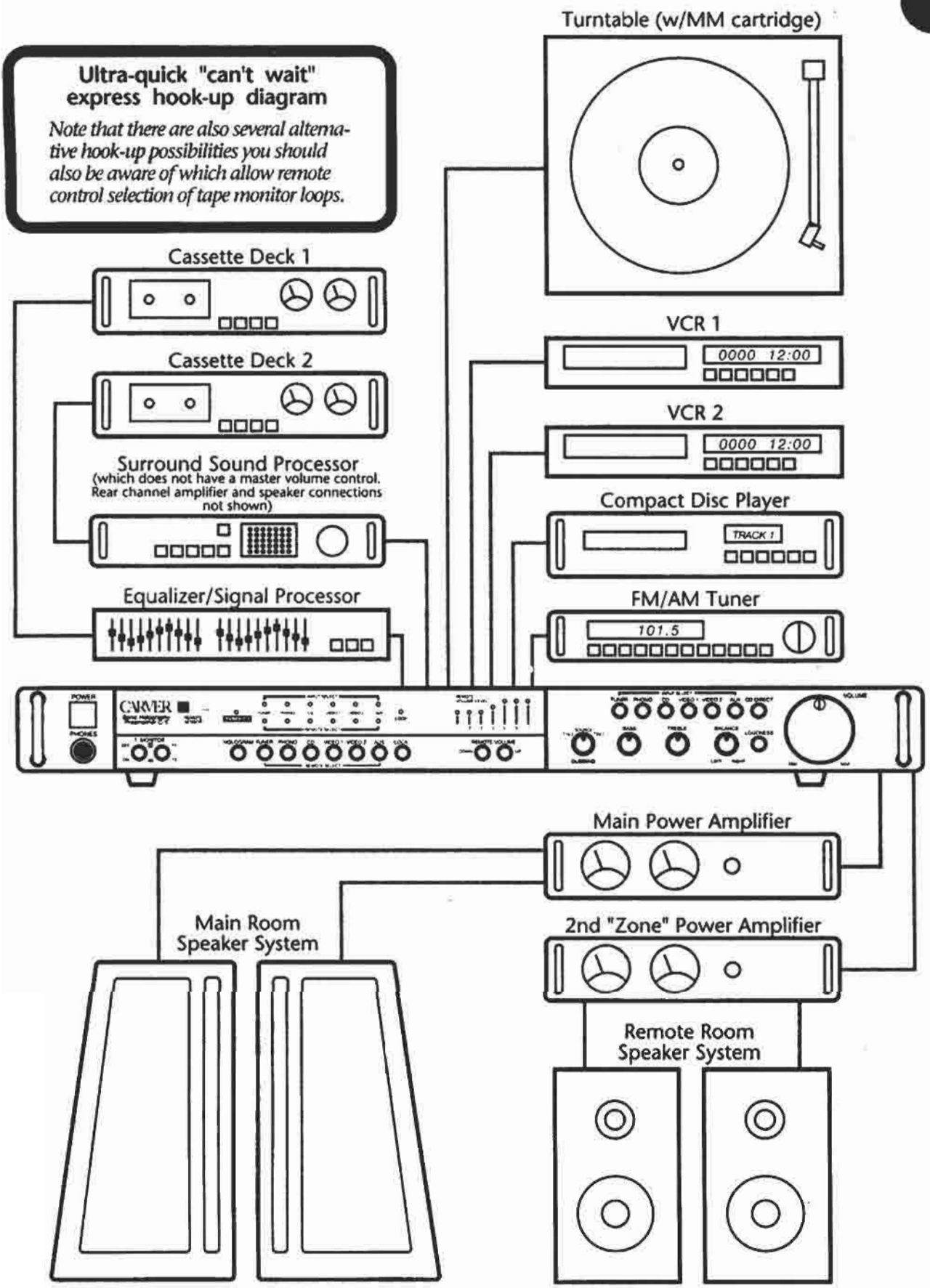
- •Tape Deck 1
- •Tape Deck 2
- •Equalizer or other sound modification device
- •Some models of Dolby Surround Sound decoder

If you're connecting any of the above to your C-5, take special care to follow our instructions, illustrations and general free-form comments in the sections that follow.



Ultra-quick "can't wait" express hook-up diagram

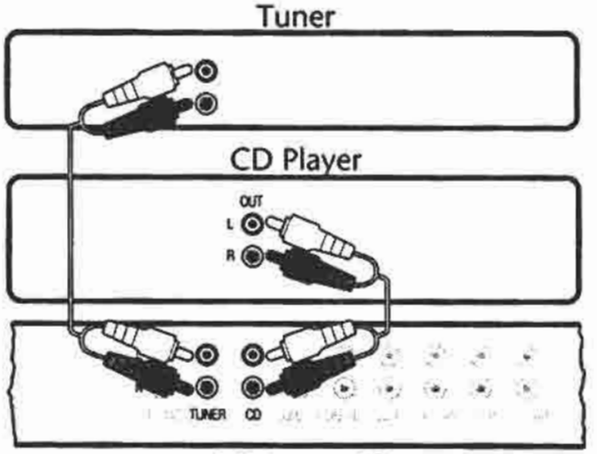
Note that there are also several alternative hook-up possibilities you should also be aware of which allow remote control selection of tape monitor loops.



CD, TUNER, AUX, VIDEO and PHONO: The basic connections

CD player. Just grab a hook-up cable and connect.

TUNER. Same procedure. If you don't own a tuner, see the next paragraphs.



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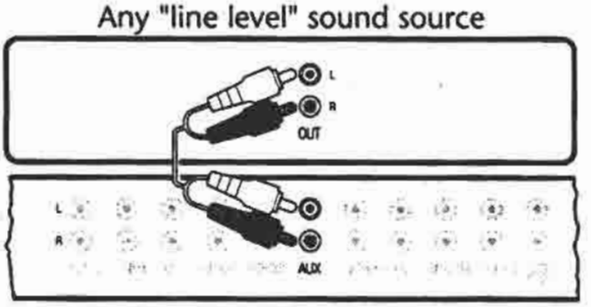
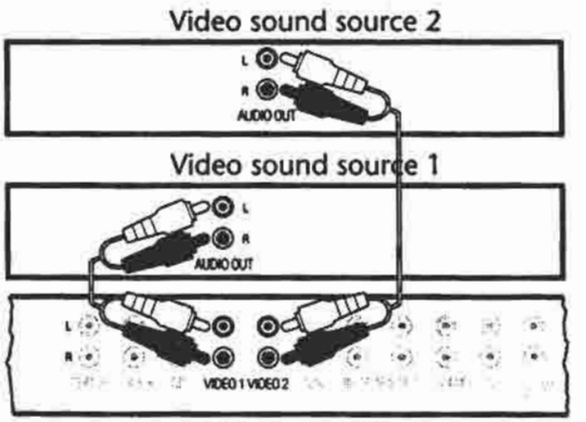
AUX. Auxiliary is designed for any additional line level audio component. By "line level" we mean a sound source with 100mV to 3 volt output – basically anything but a turntable or a microphone. AUX also has some interesting alternative uses in conjunction with tape decks which we'll cover farther on.



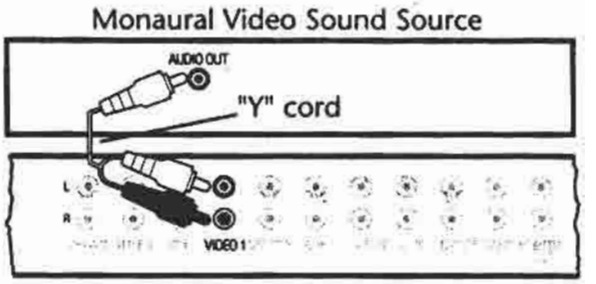
C-5 Preamplifier

VIDEO 1 & VIDEO 2. These are for video *SOUND*, not picture. Sources include VCR's, LaserDisc players, MTS stereo TV's which have audio outputs and even "deluxe" remote control cable boxes.



C-5 Preamplifier

Note: If your video sound source is mono (you'll see just one socket simply labeled AUDIO), add a "Y-cord" splitter as shown in the next illustration. They're available from many audio dealers or radio supply stores.



C-5 Preamplifier

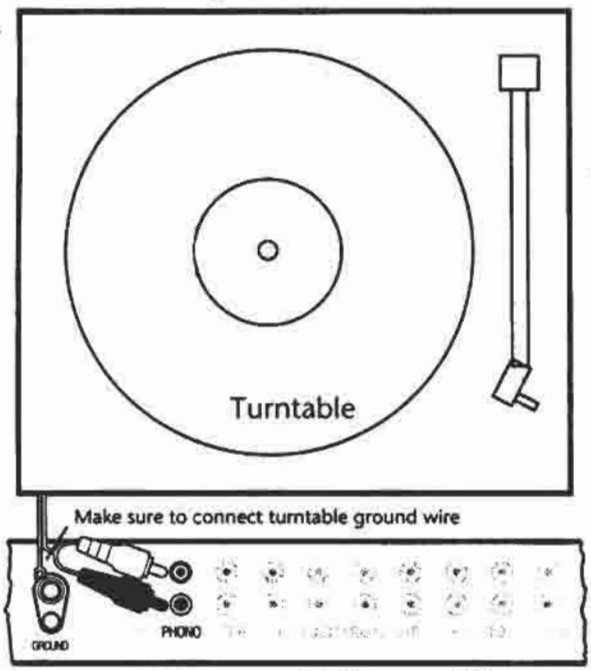
An observation about line level inputs

The C-5'sTUNER, CD, VIDEO 1, VIDEO 2 and AUX inputs can really be used for *any* line level sound source. Naturally, it's most convenient to plug your CD player into the CD input; still if you don't yet have a CD player — but DO have other sound sources feel free to connect them. We've encountered videophiles with three VCR's and a LaserDisc player. Tapists with four or five decks, some of which are only for playback. Just remember what you've connected where and use the C-5's inputs as you see fit.

PHONO. This phono circuit is designed for moving magnet cartridges (Gain: 36dB; impedance: 47K ohms resistance in parallel with 150pf capacitance). If you are using a low-output moving coil cartridge, you will need a step-up device such as the Carver MCt.

If your turntable has a ground wire, make sure to secure it's ground wire to the C-5 ground post.

NOTE: Do not plug line level inputs such as CD players, tape decks, VCR's etc. to this input. Severe overloading and distortion will result.



C-5 Preamplifier

TAPE 1 and TAPE 2: The loop connections

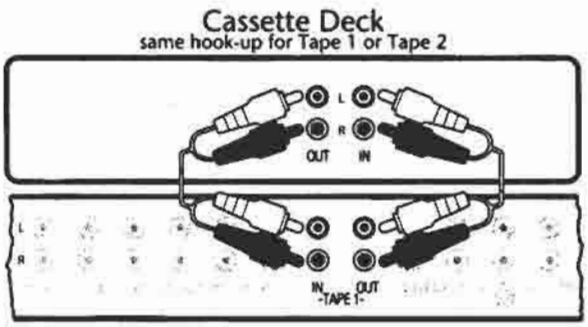
As we explained earlier, tape hook-ups are 2-way connections. A signal to be taped goes out of the C-5 to the cassette deck; a signal returns to the C-5 when you press the deck's PLAY button. As you'll soon see, these loops can beget their own loops for signal processing equipment, too.

Two DIFFERENT tape connection options

The C-5's remote control does not have a tape monitor selector button. Thus, if you connect a deck in the conventional manner, you can't select it as a source by remote control. See the alternate hook-up below which returns the deck's signal into the AUX input.

The following is the *conventional* connection for one or two cassette decks. If you 1) don't plan to use the C-5's remote, 2) have a cassette deck that isn't remote control or, 3) don't plan to use the C-5's 2-zone capabilities, this hook-up is recommended.

"Conventional" tape hook-up



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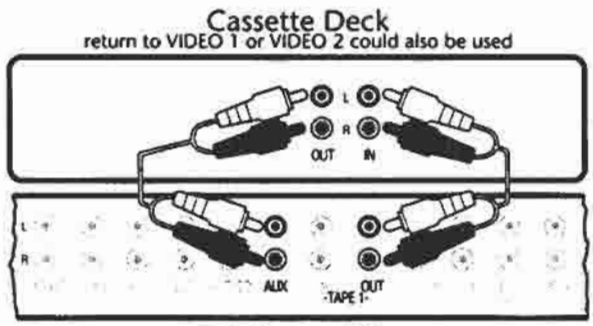
An alternative hook-up makes it possible to select a tape deck as a sound source via the C-5's remote control. It also allows you to listen to a tape in another room while a different source is playing in your main listening room.

"Alternative" tape hook-up



C-5 Preamplifier

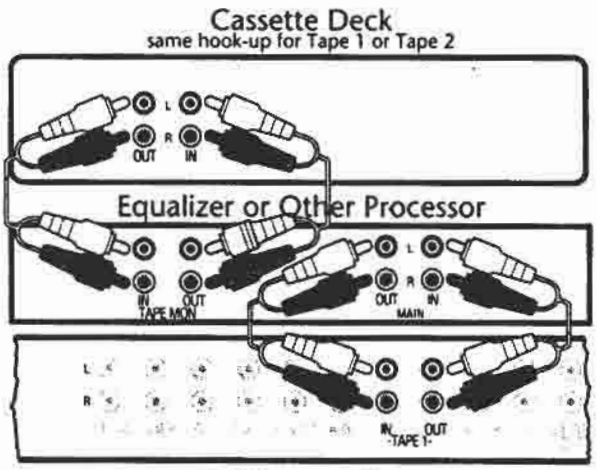
Adding sound enhancement components

There are all sorts of "black boxes" which you can add to your system. These include equalizers, dynamic expanders, hiss reduction units and multi-function units such as surround sound decoders and special equalization boxes which must be used with some speaker systems.

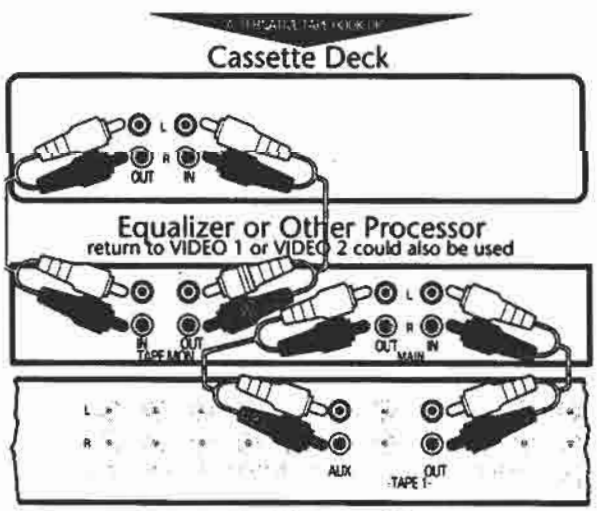
Where you connect them will depend on two things:

1. Whether the sound processor is designed to be used with your cassette deck. For example, many equalizers have a EQ TAPE button that lets you adjust the tonal balance of cassette recordings as you make them. A surround sound decoder, on the other hand, has no record output to a tape deck.
2. Whether you have one or two cassette decks.

If you want the sound processor to be able to affect cassette recordings, use the following hook-up. Note that we have shown the equalizer's output returning to the C-5's TAPE 1 - IN. As indicated in our alternative connection diagram above, it could also be connected to AUX, VIDEO 1 or VIDEO 2. Either way, the signal processor is connected to the C-5's tape monitor loop; then the cassette deck is connected to the signal processor's tape monitor loop.



C-5 Preamplifier



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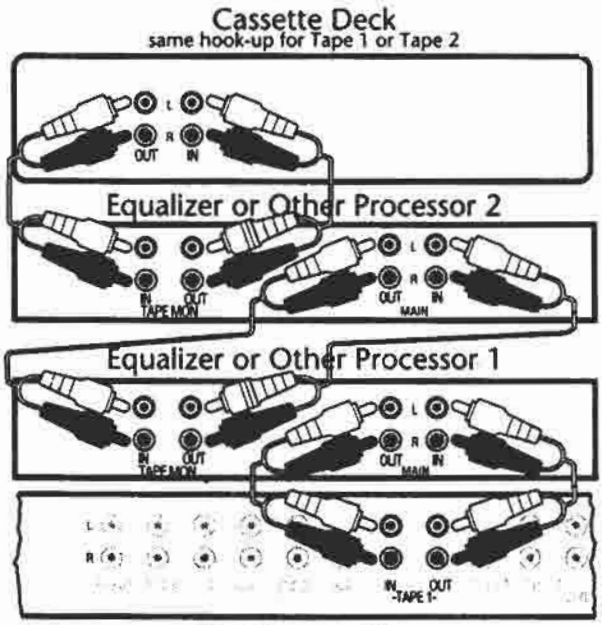
Any time the C-5's TAPE MONITOR button is pressed, the sound from any signal source will be affected by the signal processor. Yet you can still record and play back with the cassette deck.

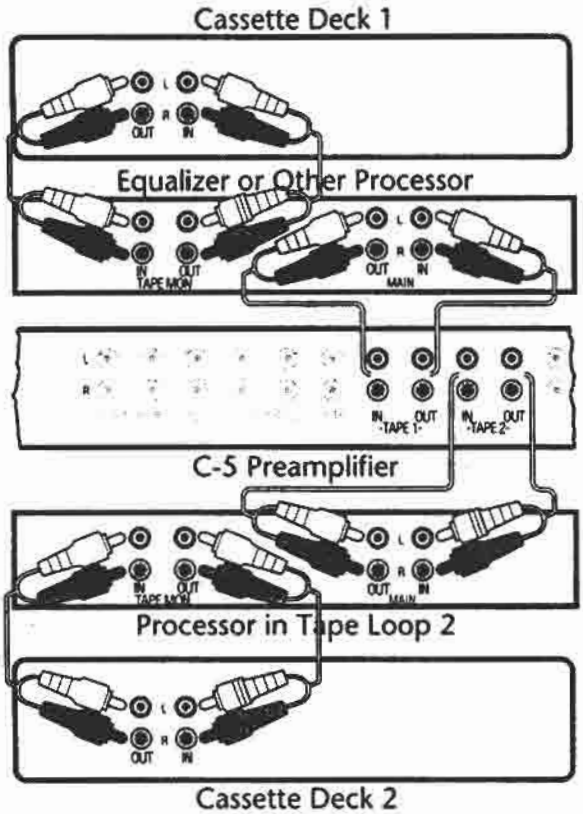
This is the recommended hook-up for use with leave-them-on-all-the-time components like the speaker control box that comes with a popular brand of "direct reflecting" speakers.

If you have more than one signal processor, for example an equalizer and a dynamic expander, simply "daisy chain" them as shown with the tape deck as the last loop.

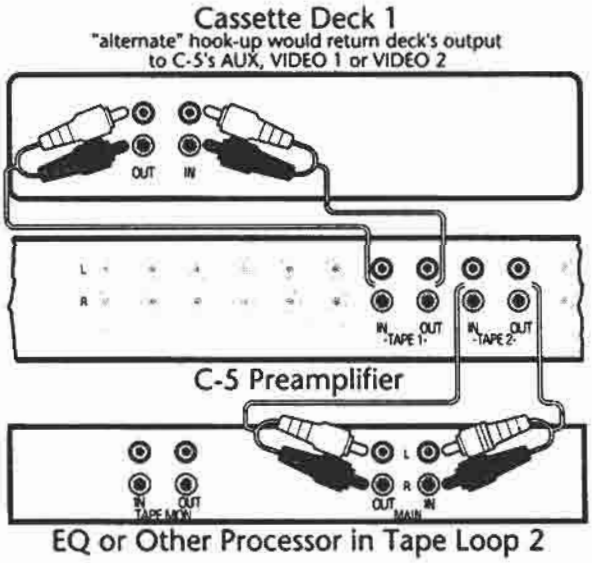


C-5 Preamplifier
alternative hook-up would return MAIN OUTPUT of Processor 1 to C-5's AUX, VIDEO 1 or VIDEO 2

Another possibility is to connect two different processors and cassette decks in separate tape loops. As we'll explain shortly, you can still "process" the sound of any sound source (except tape) through both sound enhancement components. Each individual processor, however, can only affect the tape deck that's in the same loop with it.



If a signal processor is NOT used in conjunction with cassette deck recording or playback, you have another alternative. This is especially handy for many brands of surround sound decoders which do not have a master volume control. Simply place the decoder in the C-5's second tape monitor loop.

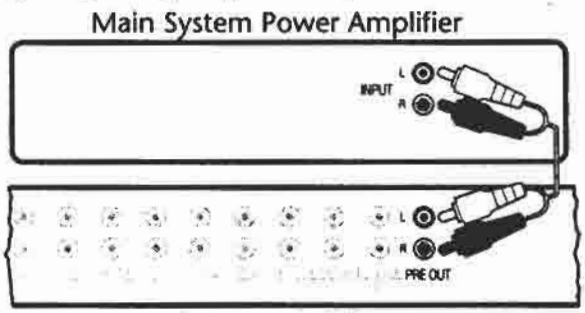


NOTE: Surround sound processors, such as the Carver DPL-33 Pro Logic® Amplifier/Processor, which have a MASTER volume control which affects both front and rear speakers should be placed between the C-5 and your power amp (this is covered farther on).

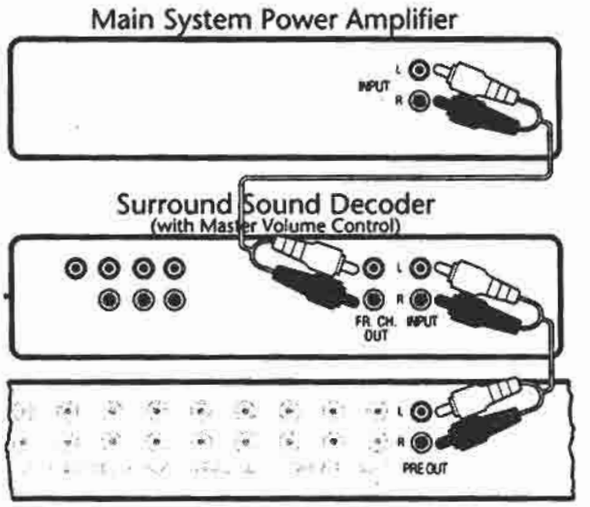
Processing sound through TWO sound enhancement devices when they're hooked into different tape monitor loops is easy. Just take advantage of the C-5's DUBBING feature. When dubbing is set to 2->1, a music source is routed through the TAPE 2 loop, "processed" and then sent to theTAPE 1 loop, "processed" some more and then returned for listening. Sounds complicated and it DOES mean you have to be quite familiar with the C-5's tape monitor system, but *very* handy if you like to add "black boxes".

PRE OUT: Next stop, the power amp

This is a simple connection. Just connect hook-up cables from the C-5's PRE OUT to the left and right inputs of your power amplifier.



If you're using a surround sound processor which has a master volume control, connect it in-between the C-5 and your power amplifier. This is also the suggested placement for electronic crossovers or powered subwoofers which have both inputs and outputs.



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What's the other output for?

You might have noticed that the C-5 has two sets of main outputs: REMOTE OUT and PRE OUT. REMOTE OUT is designed for use with a second power amplifier and speakers in another part of your house. See DUAL-ZONE OPERATION farther on in this manual for details.

If you are not creating such a multi-room system, REMOTE OUT will probably not be used. However, there are some esoteric purposes for it. When the LOCK button is pressed on the C-5's front panel, the REMOTE OUT sockets receive the same sound source (i.e. CD player) as the PRE OUT's do. Thus you could use these outputs (in LOCK mode only) for a feed to another amplifier and subwoofer with passive crossover, or simultaneously power two stereo amplifiers at once (although it will not include Sonic Holography® or other signal processing from the C-5 — the signal to the REMOTE OUT jacks is "straight wire").

Convenience outlets

We cover these last because we don't want to encourage you to plug anything in or turn anything on until all connections have been made.

Four AC outlets are provided on the back of your Carver C-5. The two that are marked SWITCHED provide power only when the C-5's power switch is pushed. They are useful for components which you use every time you play your system such as an equalizer, a speaker equalization box, etc. or your most-used sound source — CD player or tuner, for example.

C-5 switched outlet warning

Do not plug power amplifiers into the C-5's switched outlets. Make sure that total power consumption of other components plugged into these outlets does not exceed 500 watts.

Two *UN*SWITCHED AC outlets are also provided. They are always live as long as the C-5 is plugged into the wall. A device connected to one of these outlets may be left permanently on, or may be switched off with its own switch. NOTE: In order to avoid turn-on thumps, devices plugged in here should be powered up BEFORE the C-5 is turned on. BIG EXCEPTION: your power amplifier. . . It should be turned on LAST.

C-5 unswitched outlet warning

Take care when plugging power amplifiers into the C-5's UN-switched outlets. The two outlets' combined power rating is 1000 watts. Consult your power amplifier's owners manual to determine its overall power consumption if in doubt.

The final, obvious connection

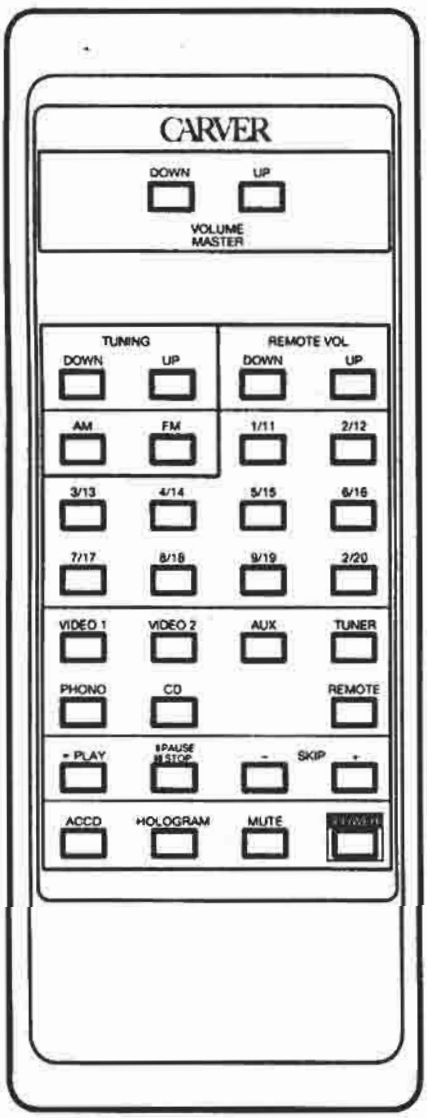
You guessed it. After making sure that the C-5 is off, plug it's power cord into a wall receptacle.

After a short section on the C-5's remote control, you'll be ready to start enjoying your Carver preamplifier!

Remote control

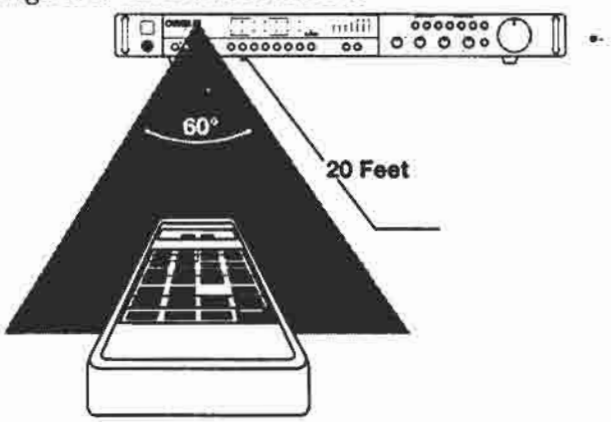
Batteries

The C-5's wireless infrared remote requires two AA batteries. Remove the battery compartment door on the back of the remote control by sliding it parallel to the surface of the remote. Insert the batteries supplied making sure to match the positive (+) and negative (-) ends as indicated by the diagram inside the battery compartment.



Remote Operation

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 C-5.



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 C-5 infrared remote sensor square (located directly above the Carver logo on the front panel) is not dirty or blocked from direct line-of-sight contact with the remote.

If you choose not to use the C-5's remote, but put the batteries in it anyway just to try it out once, remove them to prevent corrosion damage. AA cells are not housebroken.

Remote "differences"

Several EXTRA functions are found on the remote which are NOT found on the C-5 front panel:

- TUNING
  - DOWN
  - UP
  - FM
  - AM
- TEN PRESET BUTTONS labeled
  - 1/11 to 10/20
- ACCD (Asymmetrical Charge-Coupled Detector circuit).

These are designed to for use with our TX-12 remote control FM/AM tuner, eliminating the need to fuss with an extra remote.

- MUTE. When depressed, the MUTE button reduces master volume level by 20dB. Pressing it again restores the previous sound level.

Bonus nifty feature: Pressing MUTE also changes the inset LED on the C-5's volume control from green to red so you know the sound is just muted instead of turned down.

MUTE, incidently, does not affect the REMOTE (second system) output.

•CD TRANSPORT CONTROLS
PLAY
PAUSE/STOP
– SKIP
+ SKIP

Remote CD transport compatibility

The buttons on the C-5 remote let you control the primary functions of Carver TL-3100, TL-3200, TL-3220, TL-3300, MD/A-420 and SDA-450 single-play compact disc players. Consult your Carver dealer concerning CD player models released after this manual was written (summer 1990).

Other remote functions

VOLUME MASTER controls the loudness of the main system (i.e. the amp connected to the C-5's PRE OUT sockets).

REMOTE VOL(ume) allows you to adjust the loudness of a second system somewhere else in your home. It is especially valuable when used with Carver's RemoteSystemLink℠ or remote transmitter systems, since you can take your C-5 remote with you and use it in another part of the house.

INPUT SELECTIONS include PHONO, CD, VIDEO 1, VIDEO 2, AUX and TUNER. Note that a tape monitor button has not been included on the remote. If you have a remote control cassette deck and want to remain in your listening position, use the alternate cassette deck hook-up shown earlier in this manual. It routes tape output to the AUX input which IS selectable with the C-5 remote.

REMOTE is used with the input selection buttons to choose sound sources for a remote music system in another room.

Selecting a REMOTE source from the remote

When you press the REMOTE button on the C-5's remote control, you have about 5 seconds to select a source for the second zone. Then the remote's source buttons (CD, TUNER, etc.) automatically revert back to making selections for the main system.

When REMOTE is pressed, the remote controller input function buttons now select the sound source for the second zone.

REMOTE VOLUME independently controls the volume of a second sound system in another part of your house.

HOLOGRAM activates the C-5's SONIC HOLOGRAPHY® spacial enhancement feature for the main system only.

POWER fires up the C-5 and any components connected to its SWITCHED rear panel outlets.

If you're not using the C-5's dual-zone capability at this time, skip the next section and go directly to "Enjoying your C-5" beginning on page 20.

Dual-Zone: different tunes in different rooms

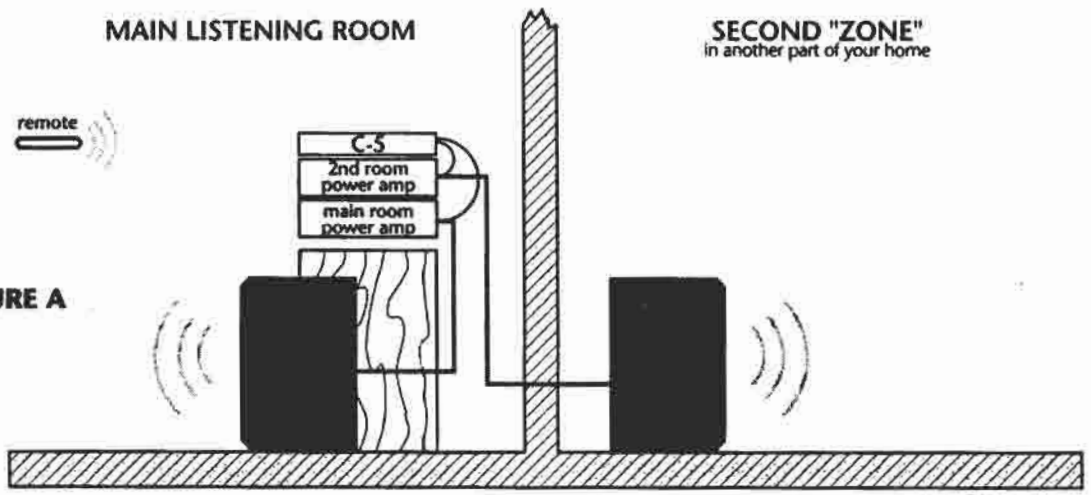


FIGURE A

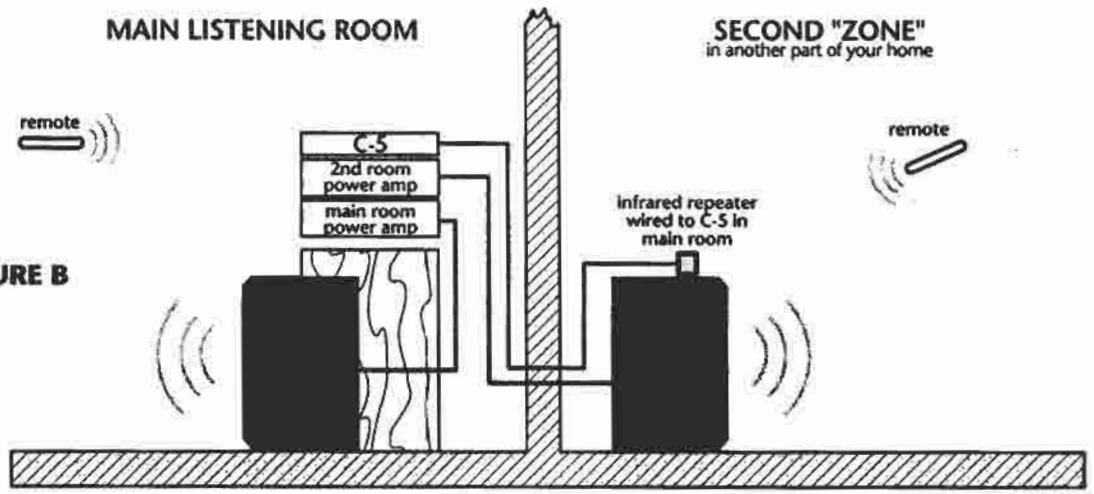


FIGURE B

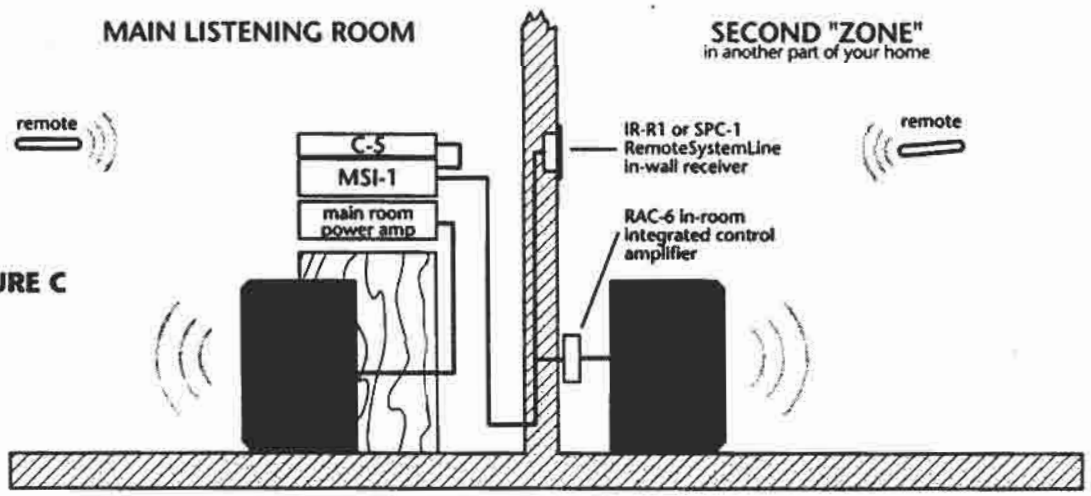


FIGURE C

With the advent (no pun intended) of high quality in-wall speakers, sound systems are branching out of the main listening room. People are beginning to appreciate the convenience of background music in a den, dining room or bedroom, the fun of outdoor speakers on a deck, patio or poolside, the value of letting a teenager listen to THEIR music in THEIR room without having to buy a complete additional system.

The C-5 was designed to make this possible just by adding one extra power amplifier– it is essentially two audio preamplifiers in one. In other words, you can simultaneously play two different music sources independently into two different areas of your home. Both can be controlled from the same C-5 remote, a universal remote or via Carver's RemoteSystemLink room-to-room system.

Figures A, B and C on the previous page show three different ways to use the C-5 to send music to different parts of your home. They represent three different levels of convenience, complexity and expense.

The hook-up in Figure A requires nothing more than a second power amplifier and wire to run from the amp to built-in or external speakers in another room.

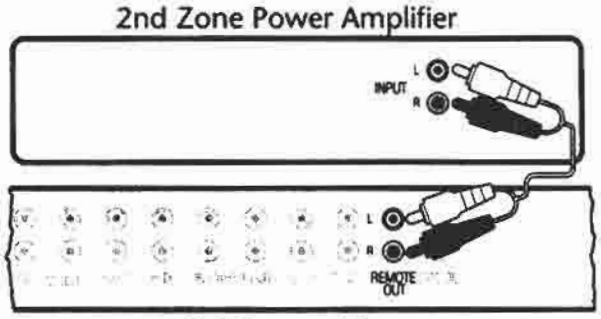
Figure B is essentially the same system but with a remote Infrared Pick-Up plugged into the back of the C-5. Available from many audio retailers and radio supply shops, these devices relay remote control signals from another room. Any IR (InfraRed) relay system which uses a 3-conductor mini phone plug is compatible with the C-5.

Figure C represents a true, built-in, multi-zone room-to-room system using Carver's RemoteSystemLink. This type of system uses a special system interface box which independently selects up to eight inputs for distribution to as many as fifteen rooms. If you are contemplating having a new home built or an extensive remodeling, consult your Carver dealer for more information on RemoteSystemLink.

Basic 2-zone connections

Simply plug a hook-up cable between the C-5's REMOTE OUT sockets and the inputs of a second power amplifier.

If you're using a remote IR repeater, plug it into the C-5's rear REMOTE SENSOR jack.



C-5 Preamplifier

The only other necessary connections are between the second power amplifier and the speakers in your second "zone".

Here, a serious consideration is speaker wire run length. The audio signal will be degraded if you use cable which is too thin (always a temptation in order to make it more unobtrusive).

- For runs up to 50 feet, use 14-gauge or under for 100-400 watt amplifiers and 16 or 18-gauge for lower-powered amps.
- For runs over 50 feet and up to as long as 150-feet, use no thinner than 12-gauge wire or a special speaker wire such as SuperFlex by Monster Cable.
- Never use smaller than 18-gauge under any circumstances.
- Always use multi-stranded wire.
- Determine the impedance of the speakers you're using in your secondary system. If they're 8 ohms, you'll probably be able to use TWO sets of speakers in your remote zone (especially handy for outdoor systems or kitchen-dining room combinations). Just make sure not to use two sets of 4-ohm speakers unless your secondary system power amplifier is specifically rated for continuous 2-ohm operation.
- Finally, avoid the temptation to put the secondary system power amplifier in another room to cut the speaker cable wire run. Conventional hook-up cables severely cut high frequencies and overall output if they are longer than 20 feet. Besides, that's why we offer our RemoteSystemLink system that can

send a clean line level signal 1000 feet or more...

REMOTE SELECT & REMOTE VOLUME buttons

The key to the C-5's dual-zone capabilities is its second set of input selectors, the REMOTE SELECT bank of buttons ON THE C-5'S FRONT PANEL just below the display panel. Press one and the corresponding source is sent to the second zone. Note that a separate LED lights up in the REMOTE SELECT row on the C-5's display.

To control the volume in the second zone use either the REMOTE VOLUME UP & DOWN buttons on the front panel or on the C-5's remote.

REMOTE OUT sound

The signal present at the REMOTE OUT sockets on the back of the C-5 is not affected by the preamplifier's tone controls, loudness equalization or Sonic Hologram Generator. Signal processors for use with a second should be placed between the C-5's remote outputs and the 2nd power amplifier

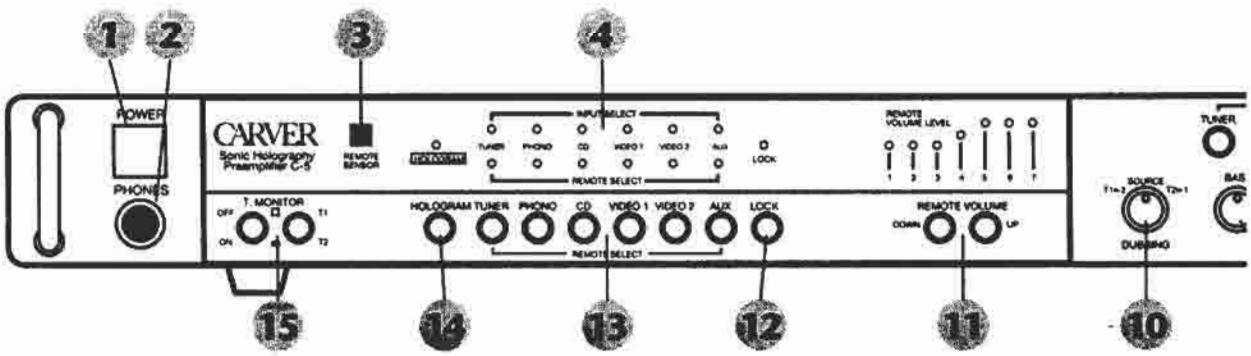
The LOCK button. Just to the right of the REMOTE SELECT buttons ON THE C-5 FRONT PANEL is one labeled LOCK. When this button is engaged, the second zone receives the SAME sound source as the main system. Pressing any of the REMOTE SELECT buttons has no effect. If you have used the "conventional" tape connection, LOCK must be pressed in order to listen to a tape in your second zone.

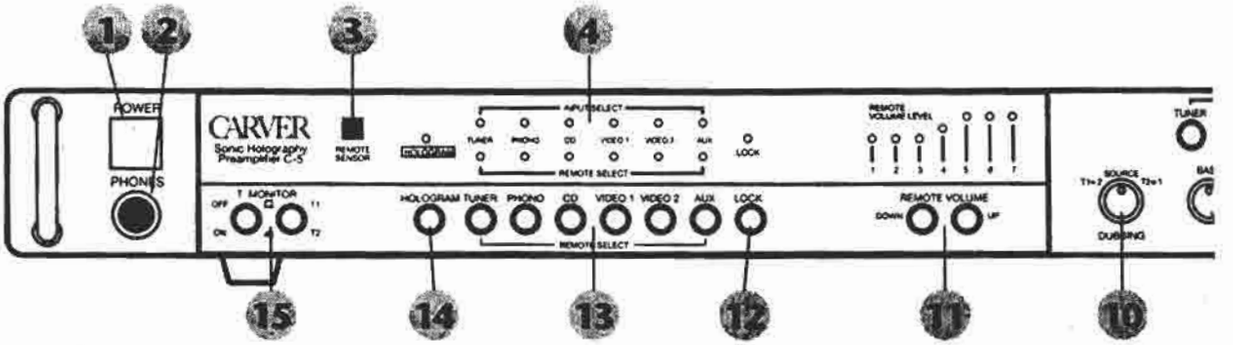
C-5 features and functions

It's time for a short guided tour of some of the C-5's controls and features. If you're eager to listen instead of read, skip to the next section starting on page 20 and read this part later.

1. POWER. This is the C-5's ON/OFF switch. It also affects the two SWITCHED convenience receptacles on the back of the unit. The C-5 employs an electronic "clamper" to mute the main outputs and headphone output during turn-on and turn-off. This reduces loud transients which could damage a speaker system. This muting system will turn off the signal to your power amplifier... 1) for about 3 to 5 seconds after initial power-on, whether by the front panel power switch or from the C-5 remote; 2) immediately at turn-off, whether by the power switch or by external switches.

2. HEADPHONE jack. All conventional dynamic headphones may be plugged in here. Headphone impedance may be from a few ohms to several thousand ohms, although output level may vary depending on impedance. The headphone jack is driven by a separate internal amplifier, designed to provide the extra voltage and current gain needed. The signals present at the headphone jack are identical to those at the C-5's PRE OUT output.





When you plug in headphones, the output to your main system speakers is muted. It is recommended that headphones be unplugged from the C-5 when not being used to avoid risk of damage to them at high volume settings.

3. REMOTE SENSOR. We mention it only to note that you should keep it clean so that reception of the C-5's infrared remote signals isn't blocked.

4. DISPLAY PANEL. Two rows of LED's show which source has been selected for main and remote (2nd zone) systems. There are also indicators for the remote LOCK feature and Sonic Holography®. To the left of the main display is a 7-LED remote system volume indicator.

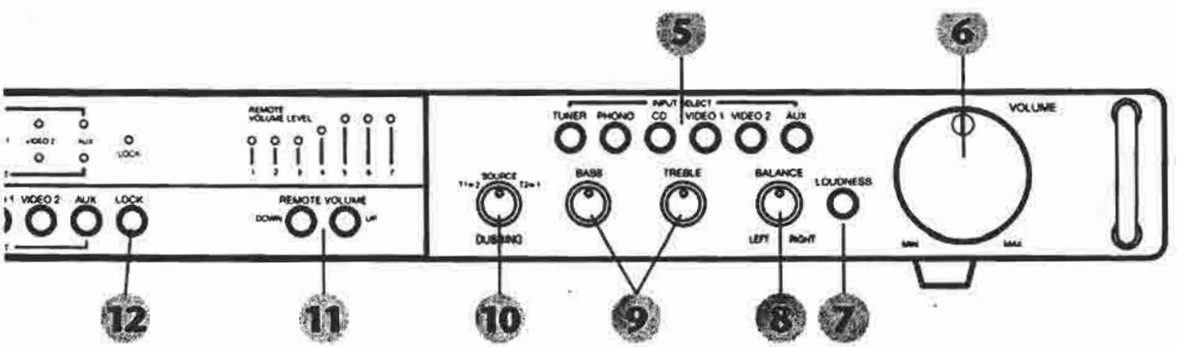
5. INPUT SELECT. Unless you're using the C-5's dual zone capabilities, this is the ONLY set of source selection buttons you'll need to concern yourself with.

6. VOLUME. This is the volume control for your main system. It is motorized so that it actually rotates when VOLUME UP or DOWN is pressed on the C-5 remote. Do not attempt to manually impede its rotation if someone else is adjusting the volume by remote control.

7. LOUDNESS is a special equalization circuit designed for improved sound at low, "background" listening levels. Due to certain characteristics of the human ear, we're more sensitive to midrange sounds at low volume levels than we are to high and low frequencies. The loudness circuit compensates for this by boosting high and low frequencies, creating a more balanced sound at low to moderate "background music" levels.

8. BALANCE CONTROL. Adjusts the left/right distribution of sound to your speakers. It is useful when one speaker is closer to your listening position than the other, or with some poorly recorded material which has more of one channel than the other. The sweep of the C-5's BALANCE control is intentionally not linear. That is, small movements off center produce smaller shifts in the stereo image per degree of rotation than near the extreme left and right positions. This makes slight adjustments more convenient.

9. TREBLE and **BASS** tone controls. Two "shelving-type" tone controls are provided for general sound shaping. The BASS control is effective below 1000 Hz; treble above 1000 Hz. At their center detent position, there is no boost or cut. Maximum rotation in either direction produces ± 10dB of boost or cut at 100Hz and 10kHz.



10. DUBBING. This 3-position switch makes copying easy by enabling you to transfer the output of one cassette deck to another.

In the center (12 o'clock) position, both TAPE 1 and TAPE 2 outputs receive whatever source has been selected with the INPUT SELECT buttons.

The left position, T1→T2, sends the output of cassette deck 1 to cassette deck 2. The T2→T1 position reverses the transfer.

11. REMOTE VOLUME adjusts the output at the C-5's REMOTE OUT outputs. These buttons are only used if you're running a second, remote room system.

Speaker placement for Sonic Holography® is critical

For maximum effect, the C-5's Sonic Holography® sound processing system requires careful set-up and adjustment of your speakers. Please consult the SONIC HOLOGRAPHY section beginning on page 23 of this manual before experimenting with the HOLOGRAM button.

12. LOCK is part of the C-5's dual zone system. When pressed, the remote system receives the same source as the main system. In effect it "defeats" the REMOTE SELECT source buttons so that selection of remote inputs can only be done from the main SELECT buttons.

13. REMOTE SELECT buttons are used to select sound sources for a remote system. Note that to hear a tape in your second zone, you must either 1) select a tape monitor input and press LOCK (if you have used the "conventional" cassette deck hook-up) or 2) select a tape monitor input and then select AUX on the REMOTE SELECT row (if you have used the "alternate" cassette deck hook-up shown earlier).

14. HOLOGRAM activates the C-5's Sonic Hologram Generator. Sonic Holography® can restore the 3-dimensionality of a live performance through special signal cancellation and time delay circuitry. It works with any stereo source including CDs, records, tapes, stereo videotapes and laser discs.

15. T. MONITOR.

TAPE MONITOR

The C-5 uses an approach to selecting either of its two tape monitor loops that differs from many other models. There are two tape monitor buttons, but they are ***not*** *labeled 1 & 2 as you might expect. Instead, one button selects TAPE as the music source and the other determines* ***which*** *tape monitor loop will be selected.*

OFF/ON, the left-hand T. MONITOR button, is used to activate BOTH tape monitor loops.

T1/T2, the right button, chooses which tape input you wish to listen to.

Naturally, the T1/T2 button has no effect unless the OFF/ON button is in the ON position.

For example, to select a cassette deck connected to TAPE 2, you would first press the ON/OFF tape monitor button (selects a tape monitor loop as the playback source when ON), and then press the T1/T2 button (selecting TAPE 2).

Step-by-step instructions for tape operations are in the next section.

If patience has prevailed and you have read this whole section BEFORE playing with your C-5, we congratulate you. Now for the fun part!

Enjoying your C-5

If you have experience with serious stereo components, you probably won't need to read this section — assuming, of course, that you've read the previous section (C-5 Functions and Features). But for the rest of us who only change stereo systems every decade or so, we've included step-by-step instructions for frequently-used functions. Don't be embarrassed to read through them. Besides, we've suggested some "alternate" hook-ups which would require you to depart from common procedures.

A short test drive

Because the C-5 is essentially the nerve center of your stereo system, lots of stuff has been connected to it, in fact, every other stereo component you own. So it's a good idea to double-check and confirm your work up to this point.

1. Check all connections, first to confirm the right components are plugged in to the appropriate C-5 inputs. Then make sure lefts are connected to lefts, etc.
2. Turn the C-5 VOLUME control down to MIN.
3. Now turn on your system in the following order:
   A. Any components not connected to the C-5's SWITCHED outlets.
   B. The C-5.
   C. Your power amplifier.
4. Load one of your favorite songs on the CD player or turntable, and then select the appropriate INPUT SELECT button on the C-5.
5. Make sure the C-5's tape monitor button is OFF.
6. Press PLAY on the sound source and gently turn up the C-5 VOLUME. Chances are, you'll hear something. Success! If the music source is operating and you hear silence, turn to the section in this manual called "HELP!" beginning on page 29.
7. Next, play your other sound sources to confirm that they're hooked up properly.
8. Rotate the balance control and see if the sound moves in the correct direction. If it seems to move the opposite way, your speaker-to-amp or C-5-to-power amp connections have been reversed and need to be switched. If the C-5 is part of a completely new system, you should check speaker phasing as well (covered in our Magnetic Field Amplifier manuals).

Playing a tape

1. Turn on the cassette deck, C-5, and power amplifier.
2. Press the TAPE MONITOR ON/OFF button in– the ON position (or AUX of the alternate hook-up has been used).
3. Depending on which tape monitor loop the deck is connected to, select either TAPE 1 or TAPE 2.
4. After loading a tape you KNOW has music on it, press PLAY on the cassette deck.
5. Adjust the C-5's volume control or press DOWN or UP on the remote control.

Recording a tape ("conventional" tape hook-up)

1. Select the source which has the original from which you wish to record by pushing one of the INPUT SELECT buttons.
2. Press the TAPE MONITOR ON/OFF button in (the ON position).
3. After loading a blank cassette into the deck and making any necessary adjustments for tape type, noise reduction, etc., put the deck into REC/PAUSE.
4. Press PLAY on the sound source.
5. Depending on which tape monitor loop the deck is connected to, select either TAPE 1 or TAPE 2, using the right-hand C-5 TAPE

MONITOR button. You're now listening to the sound as it passes through the cassette deck.

6. Adjust record levels on the deck and begin recording.
7. To hear the source, set the TAPE MONITOR ON/OFF to OFF (out). To hear the output from the deck, turn the C-5's tape monitor ON.

Recording a tape ("alternate" tape hook-up — see page 9)

If you've connected your deck so that you can select it as an input by remote control, it is not necessary to use either of the TAPE MONITOR buttons.

1. Select the source which has the original from which you wish to record by pushing one of the INPUT SELECT buttons.
2. After loading a blank cassette into the deck and making any necessary adjustments for tape type, noise reduction, etc., put the deck into REC/PAUSE.
3. Adjust record levels on the deck and begin recording.

NOTE: Don't attempt to monitor the tape deck output during recording by selecting AUX. To do so will disable the input you're recording from.

Copying a tape from Deck 1 to Deck 2 ("conventional hook-up)

1. After turning on the C-5, power amp and both cassette decks, press the C-5's TAPE MONITOR ON/OFF button.
2. Using the TAPE MONITOR T1/T2 button, select the deck which is doing the recording. We'll refer to it as the target deck.
3. Turn the C-5's DUBBING knob to either T1→T2 or T2→T1. The arrow points from the source deck to the target deck.
4. Start the playback deck and put the target (recording deck) into REC/PAUSE. You should now hear the output of the source deck as it arrives at the target deck. Adjust recording levels on the target deck.
5. Begin recording onto the target deck.
6. To monitor the source tape, release the C-5's T1/T2 button back to it's OUT (Tape 1) position. Do NOT select SOURCE on the 3-position DUBBING knob.

- If your two cassette decks differ in quality, it is general practice to use the better deck as the target deck.
- If the source tape is Dolby® B or C NR encoded, activate that type of noise reduction on the source deck. The tape will then be "decoded" before it is sent to the target deck. If you want the copy to include either Dolby B or C noise reduction, select it on the target deck. The reason for this encode/decode process is because Dolby noise reduction is quite sensitive to variations in a deck's high-frequency record and playback capabilities. If you transfer music "straight", i.e. still noise encoded, the target deck may not be able to correctly play back, resulting in a reduction or exaggeration of high frequencies. By removing the noise reduction and then adding it again, you ensure getting the best quality copy.

Copying a tape from Deck 1 to Deck 2 ("alternate hook-up)

1. After turning on the C-5, power amp and both cassette decks, press the C-5 INPUT SELECT button that corresponds with the source deck (most likely AUX).
2. Start the playback (source) deck and put the target (recording deck) into REC/PAUSE. Its meters should be reacting to the playback of the source deck. Adjust recording levels on the target deck.
3. Begin recording onto the target deck.
4. Unfortunately, it is not possible to monitor the target deck's output during playback when using the "alternative" hook-up. To do so would require changing the INPUT SELECT. This set of buttons must remain selected to the source deck for the duration of the copy process.

Signal processors and cassette deck record/playback

You may have hooked a signal processor into one of the C-5's tape monitor loops and then connected your tape deck to that component's tape loop. If so, make sure that the signal processor's TAPE MONITOR button is pushed before operating your deck. The signal processor component is invisible to the recording/playback process (unless it has an EQ TAPE recording function). But it has to be turned ON, and its TAPE MONITOR button must be pushed in.

Enhancing a video soundtrack with a surround sound decoder

If you took our advice and have connected your Dolby® processor (one which does not have a master volume control) in the TAPE 2 monitor loop, you can activate this component by pressing TAPE ON/OFF and putting the T1/T2 switch in the T2 position.

Select the appropriate VIDEO source on the C-5's INPUT SELECT section and the VCR or LaserDisc's audio will be sent to the decoder.

Dual zone operation: Playing both main and secondary systems at the same time.

1. Make sure that the C-5 and music sources are turned on.
2. Press the appropriate INPUT SELECT button either on the C-5 front panel or with the remote control.
3. Make sure that the main and remote VOLUME controls are turned down.
4. Turn on the remote and main power amplifiers.
5. Activate the sound source.
6. Advance the C-5's main volume control or press the UP MASTER VOLUME button on the remote control until you hear something.

7A. Select another sound source from the REMOTE SELECT bank of buttons on the C-5 front panel.

OR

7B. On the C-5 remote, press REMOTE and then select an input source.

8. Advance the REMOTE VOLUME control, either on the C-5 front panel or remote control.
9. Repeat Step 7A/7B to change music sources.

Playing only the secondary system.

1. Make sure that the C-5 and desired music source are turned on.
2. Confirm that the REMOTE VOLUME and main volume controls are turned down, either using the front panel or remote controls.
3. Turn on the remote power amplifier.

4A. Select a sound source from the REMOTE SELECT bank of buttons on the C-5 front panel.

OR

4B. On the C-5 remote, press REMOTE and then select an input source.

5. Activate the sound source.
6. Advance the REMOTE VOLUME control, either on the C-5 front panel or remote control.
7. Repeat Step 4A/4B to change music sources.

■ These instructions work for all inputs except tape. If you have used the "conventional" tape hook-up, press LOCK and select the tape deck via the C-5's TAPE MONITOR buttons. If you have chosen the "alternate" hook-up, select AUX on the REMOTE SELECT section (or press REMOTE on the C-5 remote control and then press AUX).

Cleaning

You'll want to wipe off the C-5'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.

Enjoying Sonic Holography®

Sonic Holography® is extremely dependent on speaker placement

After installing and connecting the C-5 to the rest of your stereo system, you'll probably be tempted to begin playing music and experimenting with Sonic Holography®. We urge you to resist this temptation for the moment. If you decide to try it anyway, not much will happen. . . because you're only part way there. Successful Sonic Holography® depends on proper loudspeaker placement and other important factors. Read the following section and follow the instructions and recommendations exactly.

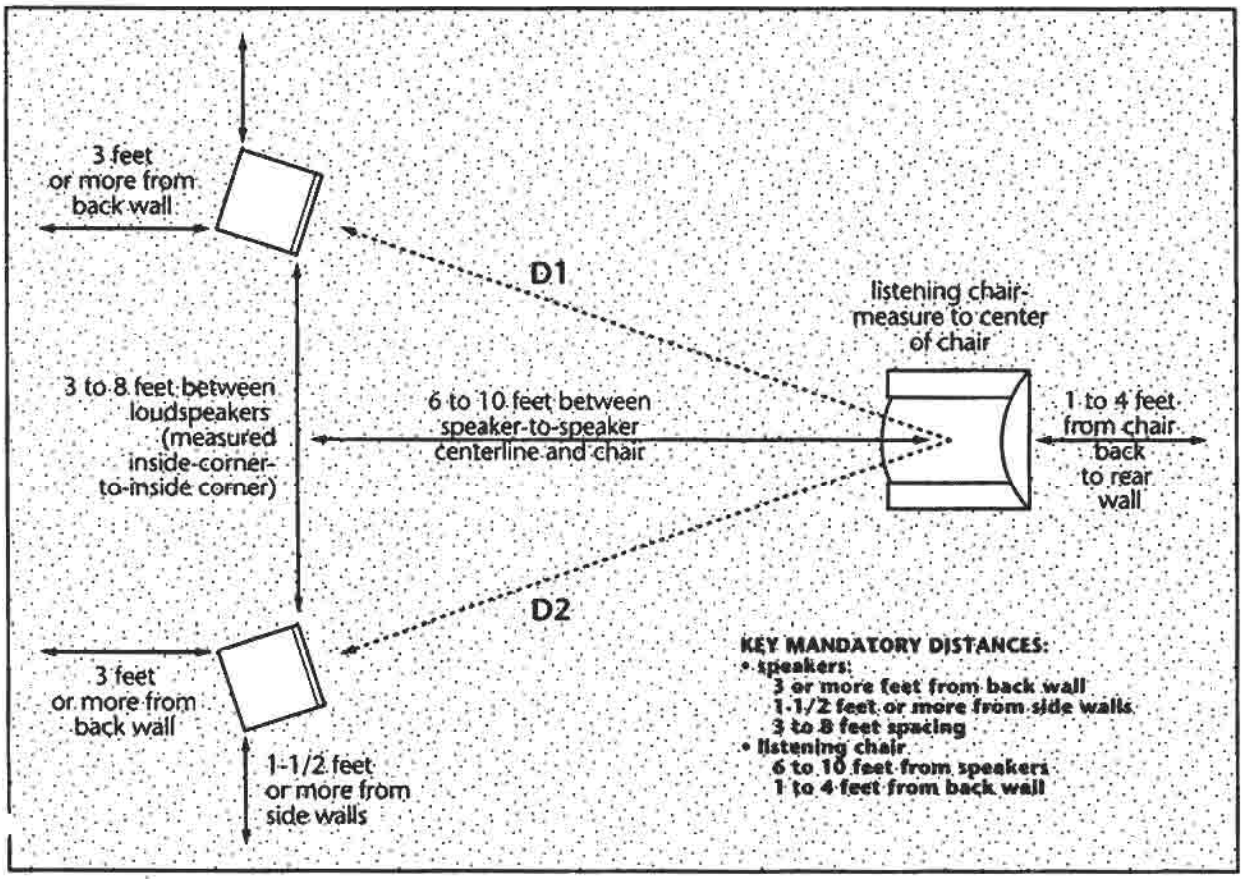
It's worth the effort

Making Sonic Holography® work properly requires attention to many factors that usually aren't problems or considerations for normal stereo playback.

The two most important factors are 1) accurate relationships between the loudspeakers and listening chair, and 2) dealing with reflected sound off surfaces in the listening room.

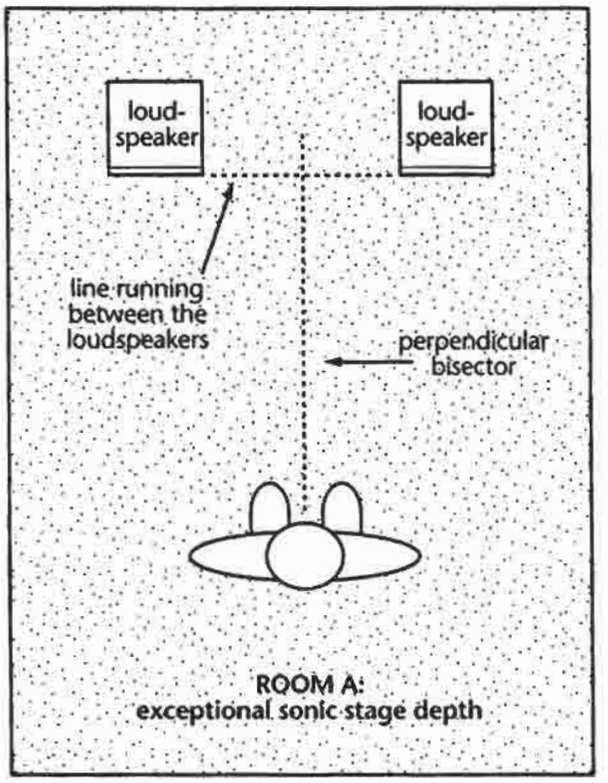
The real key to this process are the relationships between the loudspeakers and chair. While minimizing room reflections is almost as important, a musical image in Sonic Holography® will never fully occur unless the correct, accurate loudspeaker/listening chair relationship is achieved.

This whole process might seem impractical, or a lot of trouble and effort, but you'll be amply rewarded by the stunningly live imaging that Sonic Holography® brings to your favorite music.



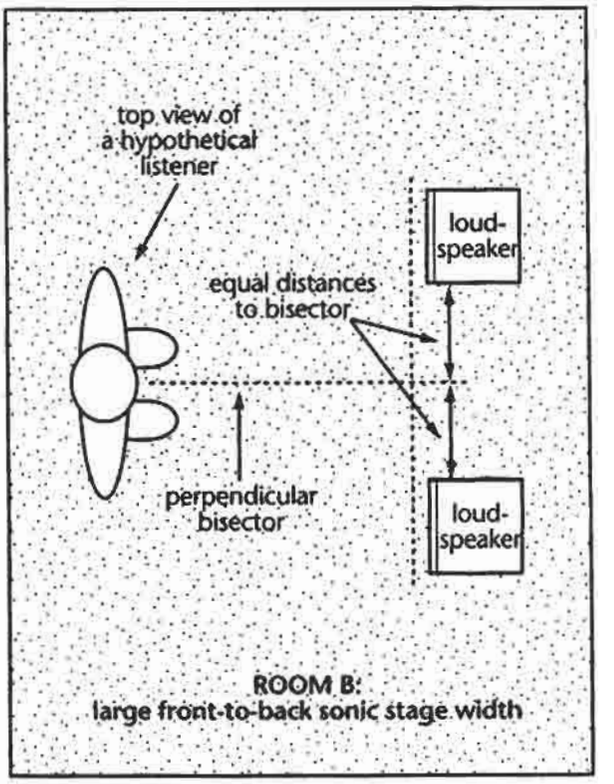
Room examples

The first two sample rooms show the loudspeakers and listening chair in perfect positions for Sonic Holography®. But, as we've mentioned, it may not be practical to place them there. It's your mission (should you accept it) to find a point where adjustments for successful Sonic Holography® can co-exist happily with the aesthetic considerations of room decor. Look at the diagram of Room A:

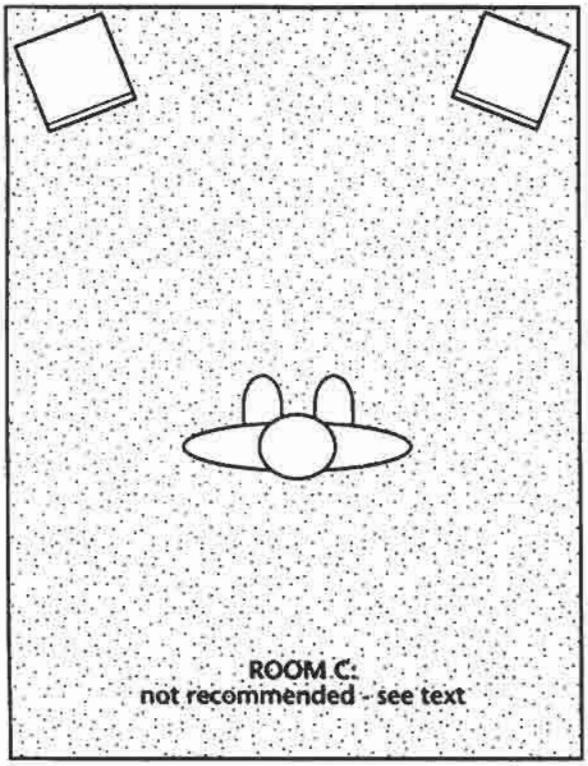


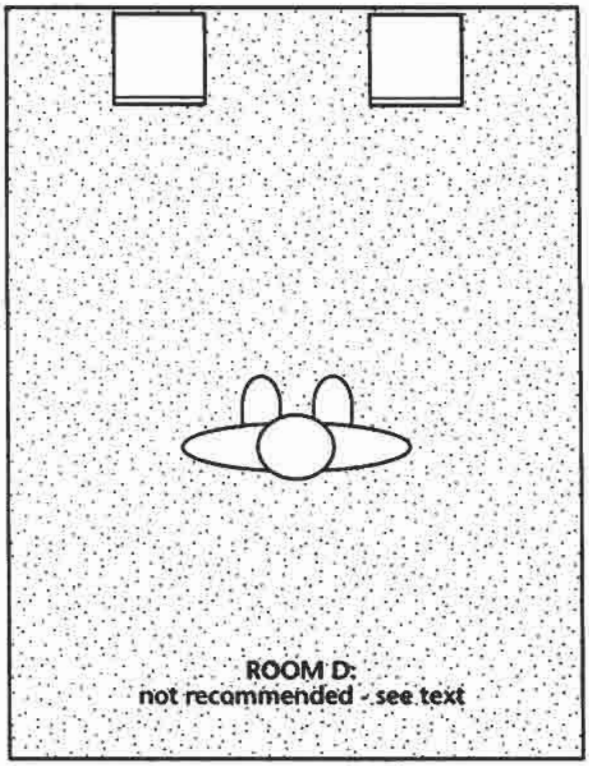
Here the loudspeakers project the long throw of the room, yielding a large front-to-back depth of the sonic stage.

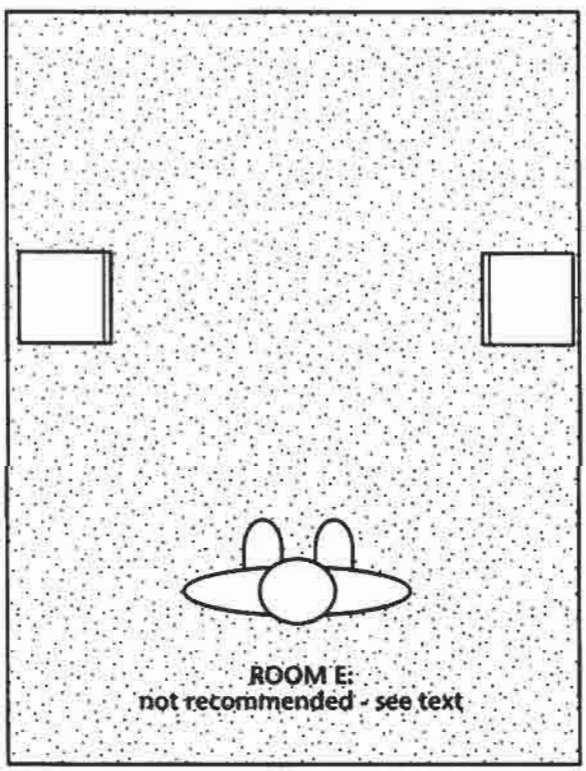
Room B, where the loudspeakers project the short span of the room, has exceptional sonic stage width and moderate front-to-back depth. Naturally the choice of positioning depends on your personal taste, as well as furnishings and overall room arrangement.

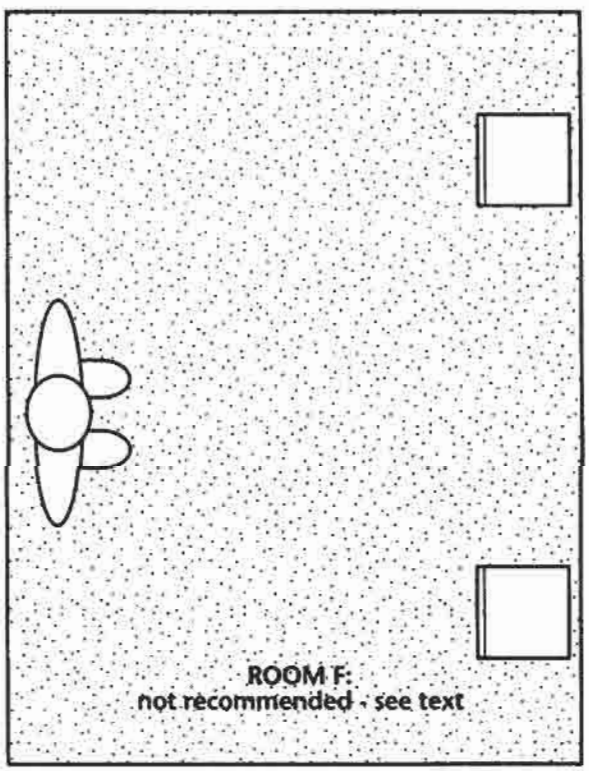


Sample Rooms C, D, E and F show configurations that won't work well with Sonic Holography®, though these same set-ups are often quite acceptable for conventional stereo playback. Other than poor loudspeaker placement, side/boundary-wall reflections will destroy chances of a good holographic image taking form.

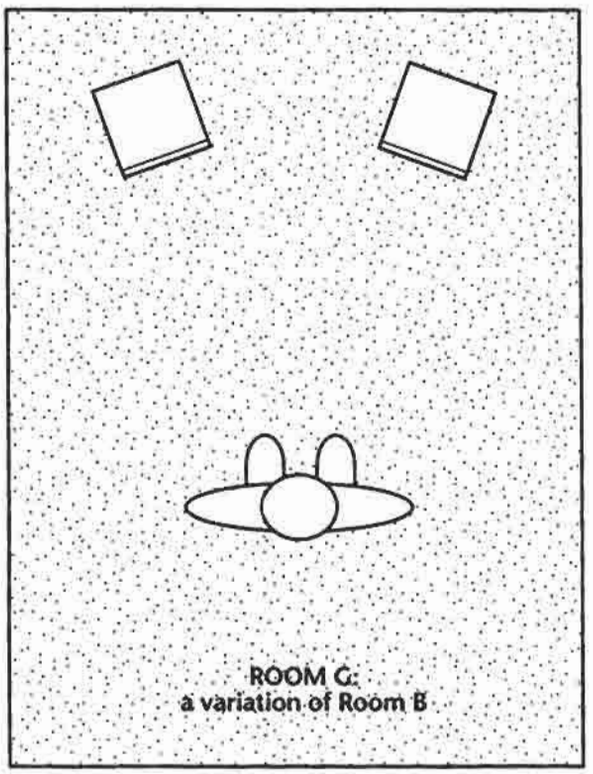


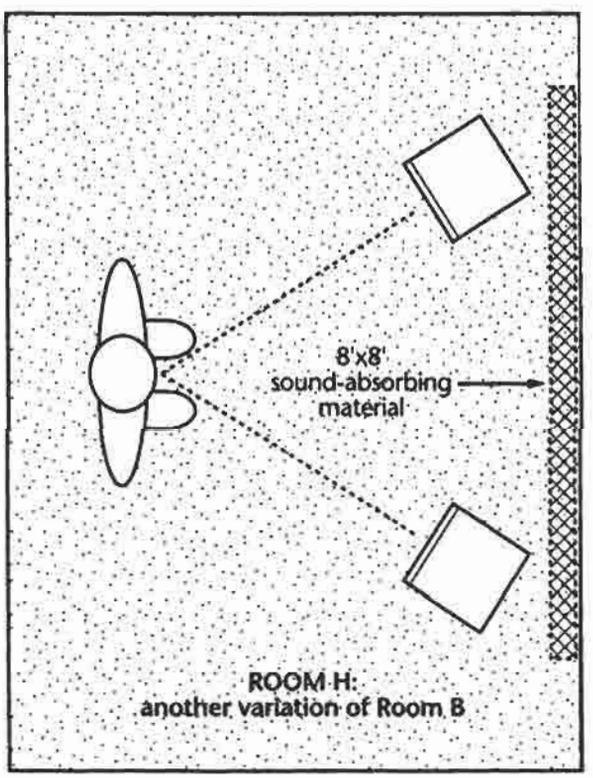






Better room arrangements are illustrated in Rooms G and H.





Room H uses a "trick" to get the loudspeakers almost against the wall behind them. This consists of a sound-deadening panel placed behind the loudspeakers, right against the wall. We'll come back to Room H in a moment.

Refer again to the diagram of Room B which compares favorably to both Rooms G and H. What makes it so good for Sonic Holography®? First, as in the initial set-up, the loudspeakers are away from corners, side walls, and the wall behind the loudspeakers. The listener is seated with a reflective wall about one to four feet behind them. This places the listener in a sound field made up of direct sound from the loudspeakers and reflected sound from the rear wall.

In Room G, with the loudspeakers still away from the side walls and corners, the listener has a nearby rear wall to ensure front-to-back depth in the holographic image. As in any good placement for Sonic Holography®, the loudspeakers are toed-in toward the listening chair. This places the listener on-axis with direct sound from the loudspeakers, further reducing side-wall reflections at the same time.

Loudspeaker designs and early reflections

The C-5's Sonic Holography® Sound Processing System uses signal delays of a fraction of a millisecond. In some loudspeakers, reflections with similar delays can be caused by protruding edge moldings, grillwork, or other front surface irregularities that might dilute an image when the C-5's Sonic Holography® feature is engaged.

Most modern loudspeakers use sound-absorbing materials, rounded corners, or even unconventional designs to reduce these early reflections. In all fairness, most loudspeakers with "conventional" front panels won't have any serious reflection problems that could hurt or weaken holographic images. However, if sound images remain fuzzy and unresolved, even with close attention to all other factors, there's a possibility it could be the result of early reflection off front-panel irregularities. The solution to this problem consists of placing a cut-out of acoustic felt around the various elements in your speakers.

Basic set-up steps for maximizing Sonic Holography®

To perform the set-up, you'll need a steel tape measure and listening chair. Refer to the illustration on 23 and follow this 5-step procedure:

1. Make sure the loudspeakers are away from side and rear walls as indicated in the diagram.
2. Move the loudspeakers so they are exactly six feet apart and on direct axis with the listening chair with direct sound from both panels.
3. Adjust the toe-in of the speakers so that the outer edge is ONE INCH closer to you than the inner edge.
4. Place your listening chair so that it is not directly against the rear wall of the listening room.
5. Carefully measure the distance from the CENTER of the left speaker's top woofer to the CENTER of the listening chair. Repeat the measurement for the right speaker. Adjust the chair so that both distances (D1 & D2 in the large illustration at the bottom of page 23) are EXACTLY the same. Accuracy within 1/4 INCH is desired.

The goal of these steps has been to place the listening chair at a point equidistant from both loudspeakers. This places a seated listener on what we refer to as the "stereo axis." Being on this acoustic centerline is very important to hearing a musical image in Sonic Holography®. If you've followed the above instructions, a seated listener in the chair should have a ready-made window for initial experiments with the Sonic Holography® Sound Processing System. You'll undoubtedly have to make some minor adjustments, but this should get things going.

Sonic Holography® operation

Before listening to some musical selections in Sonic Holography®, you should know what you will be listening for. With correctly positioned loudspeakers and listening chair, the C-5's Sonic Hologram Generator system should cause musical instruments and other sound sources to spread out in a large 45°-to-95° arc in front of you. Sound images will exist to the left and right, extending well beyond the limits of the loudspeakers and, occasionally, all the way to the extreme left and right.

You'll be able to perceive a sonic stage depth of 10 to 20 feet with sound images clearly floating behind and, from time-to-time, in front of the loudspeakers. You can actually turn your head and look at the sound images; these images will seem to stay put in space. Some sound images may even seem to clearly emerge from outside the walls of the listening room.

A "test flight"

If you've correctly established the initial relationship between the loudspeakers and listening chair, you should be able to experience Sonic Holography® at this point.

First, take a couple of minutes to "preflight check" your stereo system:

1. Visually check out and confirm that all components are connected in phase (all left-channel outputs to left-channel inputs, right-channel outputs to right-channel inputs).
2. Check and confirm that the loudspeakers are properly wired in-phase (positive "+" speaker terminals on the amplifier or receiver should be connected to the positive terminals on the loudspeakers; negative "-" outputs to negative terminals on the loudspeakers).
3. If your system employs an external equalizer to flatten room response, we recommend that you switch it out of the C-5 signal path. Wait until you've had a chance to experience and experiment with Sonic Holography® before re-equalizing the room. Room response will also be altered by any sound treatments used to reduce room reflections, so wait until phases of the Sonic Holography® set-up are complete to save time and trouble.
4. If you are using a record for a sound source, inspect the phono stylus and cartridge for proper phasing, wear, and tracking. A cartridge/stylus in poor shape can upset the balance of the program material before it gets to the rest of the stereo system. This can simulate certain acoustic problems that cause strong one-side imaging with weak imaging on the other.
5. Set the C-5's BALANCE control to "center." Set the BASS and TREBLE tone controls to their center (12 o'clock) position.
6. Press the C-5's HOLOGRAM button.
7. Play a stereo recording with only a few instruments and the human voice for first-time attempts at Sonic Holography®.

You should now hear Sonic Holography® in action.

Sonic Holography® fine tuning

Carefully adjusting the following parameters will result in the best possible Holographic image:

1. Tilt-back angle and toe-in angles.
2. Distance of speakers and listening chairs from back wall.
3. Room reflections.

TILT-BACK AND TOE-IN ANGLES. If you are in a seated position, decreasing the tilt-back angle of most typical speakers will result in more high frequency and less midrange energy at your listening position. It will also lower the soundstage closer to the ground. If you are in a standing position, these effects are reversed. Decreasing the tilt will result in less high frequency energy and will bring the midrange slightly forward.

It is possible to find a tilt-back angle that will allow the tonal balance to remain unchanged from sitting to standing. This specific angle may or may not result in the preferred tonal balance. We recommend that you determine your favorite tilt-back angle while seated. But remember, changing the tilt angle will also change the height of the sonic image. The less tilt, the lower the image. Increasing the tilt angle will, however, often enhance the dimensionality of the soundstage.

Toe-in (the lateral angle of the speakers) also affects Sonic Holography®. When experimenting with speaker angle, make sure that the speakers are equally toed in. This can be done by measuring the distance from the inner and outer corners to the back wall of the listening room.

DISTANCE FROM BACK WALL. The purpose of keeping the loudspeakers away from the walls is to provide a direct, speaker-to-ear sound path with a minimum of extra, unwanted reflections off surfaces in the room. Just as the second-sound arrivals confuse the ear in normal stereo playback, early arrivals of reflected sound can further confuse the issue and ruin attempts at creating holographic images. Always keep in mind the importance of accurate loudspeaker/listening chair relationships, keeping the loudspeakers relatively close together (three to five feet, center-to-center).

ROOM REFLECTIONS. For the best possible Sonic Hologram generation, the area around and behind your speakers should be relatively dead. If the back and side walls are too reflective, they may generate additional sound reflections which can interfere with Sonic Holography®.

The object of acoustically treating the listening room is to create what's known as a "live end/dead end" configuration. This design makes the area around the loudspeakers acoustically "dead," while the area around the listener is kept "live." Thus random sound reflections reach a listener long after the direct sound, establishing a uniform sound field.

The reflections most in need of correction in your listening room are the usually strong, side-wall reflections that originate from surfaces near each loudspeaker.

Any treatment should be applied to the wall extending two feet above and below the midrange and high-frequency loudspeaker elements, standing two to three feet from the leading edge of the loudspeaker cabinet.

The treatment itself may be quite simple. Open, full book cases or record shelves, heavy fabric hangings, or draperies made of heavy material will work well as an acoustic treatment for many situations. Sound panels made from cork or acoustical tile can be covered with a variety of other sound-absorbing materials, too.

Since side-wall sound treatments are relatively small (usually less than four feet by four feet), you could use attractive grill cloths or foam panels to improve the appearance. However, loudspeaker grill cloths or covers are not, obviously, effective sound absorbers. Scrap carpeting can be effective when used with other sound-absorbing materials.

HELP!
A trouble-shooting guide

If you're having trouble or suspect a problem, try some simple trouble-shooting first. More likely than not, the problem lies elsewhere in the system — not with the C-5.

No sound (C-5 does not light up)

1. C-5 power off.
2. Line cord disconnected.
3. Poor fit between plug and wall receptacle.
4. Power off at wall receptacle (check with tester or lamp).

No sound (power OK and on)

1. C-5 INPUT SELECT set to inactive source.
2. TAPE MONITOR ON/OFF button pushed in with no tape running.
3. External processor hooked to rear panel jacks is not turned on when the C-5's TAPE MONITOR circuits are selected.
4. MUTE button on C-5 remote is activated.
5. Selected input is simply not functioning or the connecting hook-up cables are malfunctioning.
6. Power amplifier turned off.
7. Input level controls turned down on power amplifier.
8. Speaker cables connected to wrong set of power amplifier speaker outputs.
9. Program source has a problem. For example, tuner is between stations, tape is on a blank segment, CD player is on pause.

No sound in one channel.

1. Defective cable from C-5-to-power-amplifier or music-source-to-C-5.
2. Speaker wire loose or disconnected.
3. C-5 BALANCE control fully clockwise or counterclockwise.
4. Imperfect contact in lever or slide switch in program source electronics or signal processor.
5. Speaker fuse blown.
6. Power amplifier malfunctioning.

Loud howl, squeal or whistle while taping.

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

Sonic Hologram doesn't seem to do anything.

1. Follow directions closely in the previous section of this manual.

Solo voices or instruments sound thin, shrill or distorted.

1. Treble TONE control set to maximum boost or bass control set to minimum.
2. Phono cartridge wired out of phase (re-read instructions which came with the cartridge and check out all four connections between cartridge and tonearm.
3. Speakers are connected out of phase.

Sound is weak when PHONO input is selected.

1. A moving coil cartridge which has a low output has been connected. Add a step-up transformer such as the Carver MCT-1.

Hum and constant noise

1. Defective signal cables.
2. Improper fit between signal cable plug and sockets.
3. Signal cables have been routed too closely to AC cables, power transformers, motors or TV sets.
4. Turntable or cassette deck may be oriented in such a way that it is picking up induced hum from internal AC wall wiring. Change component's position slightly.
5. Power amplifier is extremely high gain (characterized by the need to use only very low settings of the C-5 volume control). If the amplifier has input level settings, reduce them. If not, contact Carver Corporation Service Department.

Intermittent noise, static or hum caused by RFI interference from CB, TV or AM radio.

1. Determine where the RFI (radio frequency interference) is entering the system by disconnecting individual sound sources, then the C-5, then the power amplifier.
2. Use higher quality interconnect cables with better shielding.
3. Wrap turntable input cables in aluminum foil.
4. After checking with your power amplifier manufacturer, place 0.01 microfarad capacitor across speaker terminals.

Remote control won't work.

1. Batteries are dead or missing.
2. Remote is too far from or at too much of an angle in relation to the remote sensor on the C-5.
3. Remote sensor on C-5 or remote control transmitter panel are dirty.

Remote will not select source for second system.

1. You must select an input source within 5 seconds of pressing the REMOTE button. At the end of that time, the remote control "reverts" to selecting a main system input.

Service Assistance

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

If your C-5 should require service, we suggest you first contact the Authorized Carver Dealer from whom you purchased it. Should the Dealer be unable to take care of your needs, you may contact the CARVER Service Department by phoning (206) 775-6245, or by writing CARVER CORPORATION, Service Department, P.O. Box 1237, Lynnwood, WA 98046. 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.

We wish you many hours of musical enjoyment. If you should have questions or comments, please write to us at the address above.

CARVER CORPORATION P.O. Box 1237,
Lynnwood, WA 98046 (206) 775-1202.
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Patent Notice (our laywer insists. . .)

The circuitry and application of the CARVER Sonic Holography® Sound Processing System are protected by United States Patent 4,218,585 and corresponding foreign patents.

Dolby Notice (*their* lawyers insist. . .)

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