

# ICBM

## Integrated Controlled Bass Manager



# Owner's Manual

## Please Read First

**CAUTION:** To reduce the risk of electric shock, do not remove the cover (or back). No user serviceable parts inside. Refer to qualified personnel.

**WARNING:** To reduce the risk of fire or electric shock, do not expose this appliance to rain or moisture.



The lightning flash with arrowhead, 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 electrical shock to persons.



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

## IMPORTANT SAFETY NOTE

**Before connecting a new component such as the ICBM to your audio or home theater system it is always good practice to make certain that all components are turned off, and preferably unplugged from their AC power source. Many modern electronics products feature**

**automatic turn-on circuits that may be activated during an installation, causing the potential for damage to electronic components and/or speakers. Such damage is not covered by product warranties and Outlaw Audio specifically disclaims responsibility for any such damage.**

## Outlaw Model ICBM-1 Limited Warranty

This warranty protects the owner of the Outlaw ICBM-1 (the PRODUCT) for five (5) years from the date of purchase.

This warranty covers all defects in material and workmanship with the following specific exceptions. These are:

- Damage caused by improper installation or adjustment
- Damage caused by accident, unreasonable use or neglect
- Damage from failure to follow instructions contained in this Owner's Manual
- Damage from the performance of repairs by someone not authorized by Outlaw Audio
- Any unit on which the serial number has been effaced, modified, or removed
- Damage occurring during shipment
- Units which have been altered or modified in design, appearance or construction

This warranty covers only the actual defects within the PRODUCT itself. IT DOES NOT cover costs of installation in (or removal from) a fixed installation, or normal set-up, claims based on any misrepresentation by the seller, or performance variations resulting from installation related circumstances such as signal quality, AC power or incompatibilities with speakers and/or other system components.

During the warranty period, Outlaw Audio will, at its option, either repair the defect, or replace the defective product, or the defective parts, or components thereof at no charge to the owner for parts and labor covered by this warranty. If necessary repairs are not covered by this warranty, or if a unit is examined which is not in need of repair, you will be charged for the repairs and/or the examination. If non-warranted repairs are needed, we will notify you of the estimated cost and ask for your authorization to perform said repairs.

You must pay shipping charges incurred in getting your product to the factory. We will pay the return shipping charges if the repairs are covered by the warranty. Please save the original shipping cartons as the unit MUST be returned in the original carton and packing. (Replacement cartons are available at a modest charge.)

If your product needs service, please notify us at:

Outlaw Audio

Sales (866) OUTLAWS Service (866) OUTLAWA

You will need to present the original bill of sale to establish the date of purchase. In the event that the proof of purchase cannot be established with the original receipt, the warranty period shall be determined by the earliest date of manufacture shown on the unit, provided that the serial number label has not been altered in any manner, or by our records relating that serial number.

In the event that you wish to return your Outlaw ICBM-1 back to us, for any reason, please call to arrange for a Return Authorization Number. This will insure that your problem is discussed with a service technician who will determine if there is a quick solution to your problem.

Outlaw Audio shall not be liable for, in any way responsible for, any incidental or consequential damages of any kind. Some states do not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion of incidental or consequential damages, therefore, the limitations and exclusions stated herein may not apply to you. This warranty gives you specific legal rights; and you may also have other rights which vary from state to state.

THERE ARE NO WARRANTIES GIVEN BY OUTLAW AUDIO WHICH EXTEND BEYOND THE DESCRIPTION GIVEN HEREIN. ANY IMPLIED WARRANTIES OF FITNESS FOR PURPOSE SOLD, MERCHANTABILITY, DESCRIPTION, QUALITY OR ANY OTHER MATTERS ARE TO THE TERMS OF THE EXPRESSED LIMITED WARRANTY STATED HEREIN.

Products are sold on the basis of specifications applicable at the time of sales. Outlaw Audio shall have no obligation to modify products once they have been sold.

This warranty is applicable only in the United States. For applicability in other countries, please call Outlaw Audio.

# Outlaw Audio Integrated Controlled Bass Manager ICBM

Thank you for buying an Outlaw Audio Integrated Controlled Bass Manager. The **ICBM** provides the most flexible bass management capability available, while providing a high-quality signal path that preserves the fidelity of the original audio signal. It's the perfect match for:

- DVD-Audio or SACD players that do not have internal bass management capability
- Preamp/processors with limited bass management that does not properly match your speakers
- Two-channel stereo systems that do not have a dedicated subwoofer output
- 5.1-channel mixing studios that use  $-10$  dB V unbalanced feeds to the monitors

## Setup Guide

Getting the best performance out of the **ICBM** requires an understanding of the concepts behind bass management. For those who are not familiar with the intricacies of bass management and crossovers, there's a comprehensive tutorial later in this manual. However, we suspect that you are anxious to get your system hooked up. Depending on the equipment in your system, follow one of the following three set up configurations:

- Using the **ICBM** with a DVD-Audio or Multi-channel SACD Player: Page 3
- Using the **ICBM** between a multi-channel processor or receiver and an amplifier: Page 5
- Using the **ICBM** in a stereo system with a subwoofer: Page 9

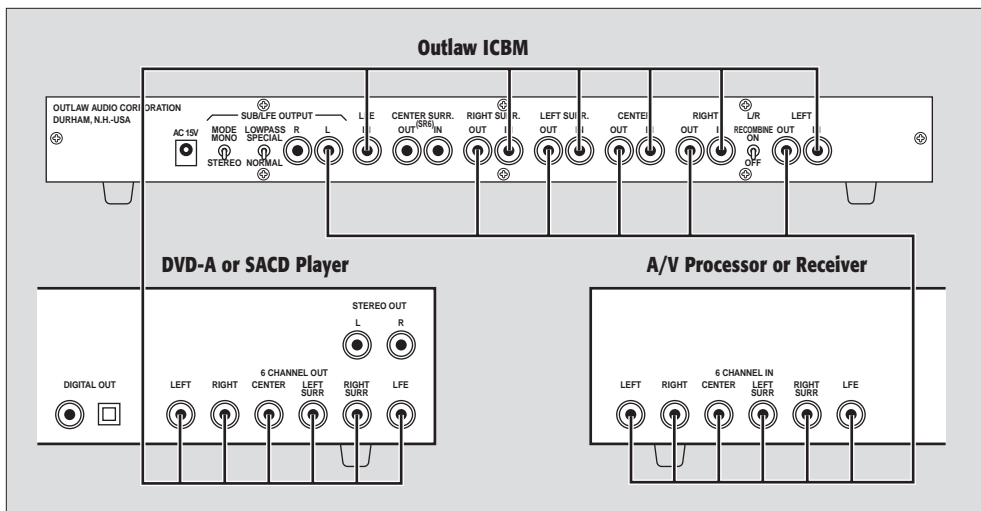
Due to issues relating to copy protection systems, virtually every high resolution, multi-channel optical playback device on the market uses a built-in decoder that delivers the output of the DVD-Audio or SACD disc as separate analog outputs. In virtually all cases, these are full range signals, but most DVD-A and SACD players provide little or no control for bass management. At the same time, since the analog "6 Channel Direct" inputs on most processors and receivers are "straight through" audio paths, they, too, lack any bass management.

This presents a problem for systems using satellite/subwoofer style speaker systems, as the lack of bass management and redirection on both the source device and the control unit means that full range signals will be passed on to bandwidth-limited speakers unable to handle the full spectrum outputs. Even where there is bass management in the analog path, it is typically limited, and unable to accommodate the wide range of crossover points required by different speakers. The **ICBM** was specifically designed to solve the problem caused by this lack of internal bass management, and is tailor made for this application.

### Using the ICBM with a DVD-Audio or Multi-channel SACD Player

For this installation, you will need 12 audio interconnect cables to connect the **ICBM** into your system. We recommend that Outlaw Audio PDA cables be used, but any high quality, shielded cables will do. It is always a good idea to keep cable runs as short as possible to minimize the potential for inducing noise

**Figure 1**  
Using the ICBM  
with a DVD-Audio  
or multi-channel  
SACD player



and RFI/EMI. Always keep audio interconnects separate from AC power cords, as well as from RF, video and data cables, if possible.

**Step 1 Turn off and unplug all system components.**

**Step 2 Look at your player's rear panel.**

You will see a set of six RCA output jacks grouped together.

Many DVD-Audio players also offer an extra set of left/right stereo outputs, which are grouped separately from the six RCA output jacks. **Don't use these!** They contain a down-mixed stereo signal that you don't want in this instance.

If you can't find six RCAs grouped together on the back, you probably have a conventional DVD-Video player or a stereo-only SACD player. In the former case, the **ICBM** should be connected between your pre/pro or receiver and your amplifiers, as explained later in this manual. In the latter, skip forward to the section that shows how to connect the **ICBM** into a stereo system.

**Step 3 Connect your player to the ICBM.**

Connect cables from the six RCA jacks on your player to the corresponding inputs on the **ICBM**—left to left, right surround to right surround, and so on.

Note that the LFE output on your player may also be labeled "SUB" or "Subwoofer". Connect that output to the LFE input on the **ICBM**.

**Step 4 Now locate the six-channel direct (sometimes labeled 5.1-channel direct) input on your processor or receiver.**

This input will also have six RCA jacks grouped together, similar to your player. If your processor or receiver doesn't have this kind of input, you won't be able to hear DVD-Audio or multi-channel

SACD, but you may be able to use the **ICBM** between your processor or receiver and your amplifiers, as explained in the next section.

**Step 5 Connect the ICBM to your processor or receiver.**

Connect the **ICBM**'s outputs to the corresponding inputs on the processor or receiver again making careful to connect right to right, left to left, and so on.

If there are any settings for bass management on the player or in the analog “direct” channels of your processor or receiver, set them to “LARGE” or “OFF” so that a full range signal is passed through to the **ICBM**. However, **do not** make any adjustments to the bass management or “speaker configuration” settings in the processor or receiver that work with the conventional digital or two-channel analog inputs. You can leave these set as they were—they will not affect the six-channel input that the **ICBM** is connected to. Make sure you're using your subwoofer's “bypass” input or control setting if it has one. If it doesn't, use the highest crossover frequency setting your sub provides.

**Step 6 Plug in the ICBM's AC adapter.**

Connect the small plug at the end of the cord from the **ICBM**'s external transformer/power supply into the matching jack on the **ICBM**'s rear panel. Plug the transformer/power supply into an AC power source. (Due to the low current draw of the **ICBM** you may safely connect it to the rear panel outlets on a processor or receiver so that it turns on automatically with your system.

**Step 7 Reconnect your system components to their AC power sources.**

**Step 8 Check your connections.**

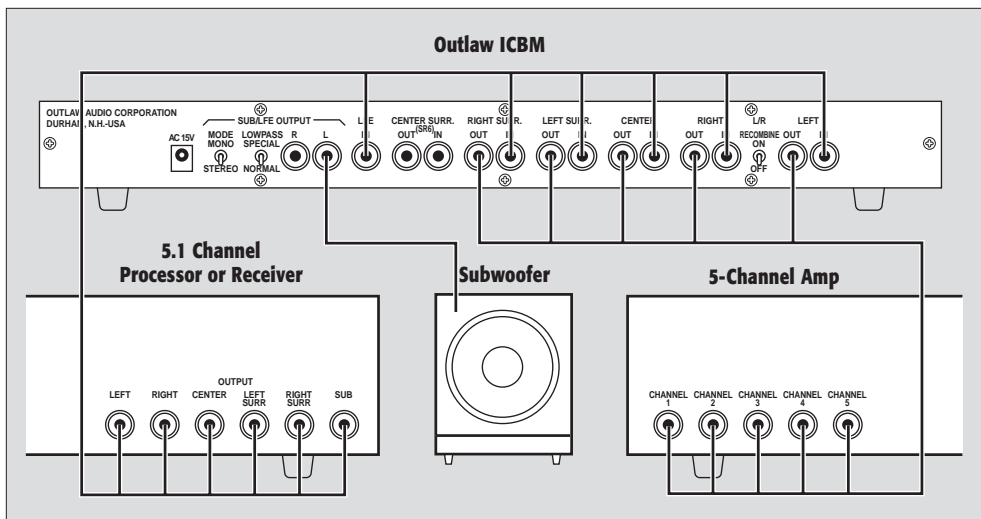
Turn your system components on. To make certain that all connections have been made to the proper channels, activate the processor or receiver's speaker balancing “test tone.” As the tone circulates among the speakers, check the front panel readout or on-screen display to verify that the sound comes from the channel shown in the indicators. If the sound is comes from the wrong channel at any time, turn off all equipment and re-check the connections between the **ICBM** and your processor or receiver to make certain that the channels are properly matched.

Once all channel connections have been verified your **ICBM** is properly connected and ready for operation. Turn to page 13 to learn how to operate the **ICBM**'s controls.

### **Using the ICBM between a multi-channel processor or receiver and an amplifier**

Depending on your system, for this installation you will need between 12 and 16 audio interconnect cables to connect the **ICBM** into your system. For 7.1 channel systems, you will also need 2 sets of “Y” adapters. As always, it is a good idea to keep cable runs as short as possible to minimize the potential for inducing noise and RFI/EMI. Always keep audio interconnects separate from AC power cords, as well as from RF, video and data cables, if possible.

**Figure 2**  
Using the ICBM  
between a 5.1 channel  
processor or receiver  
and 5 channel  
amplifier



Step 1 **Turn off and unplug all system components.**

Step 2 **Locate the appropriate outputs on your processor or receiver.**

Before you make any connections, find the “six channel output,” “eight channel output” or “preamp output” jacks on your receiver or processor’s rear panel. They are typically a set of six, seven or eight RCA jacks grouped together. If your receiver or processor does not have these jacks for ALL channels we recommend that you use the configuration for a two-channel stereo system, as shown on page 9.

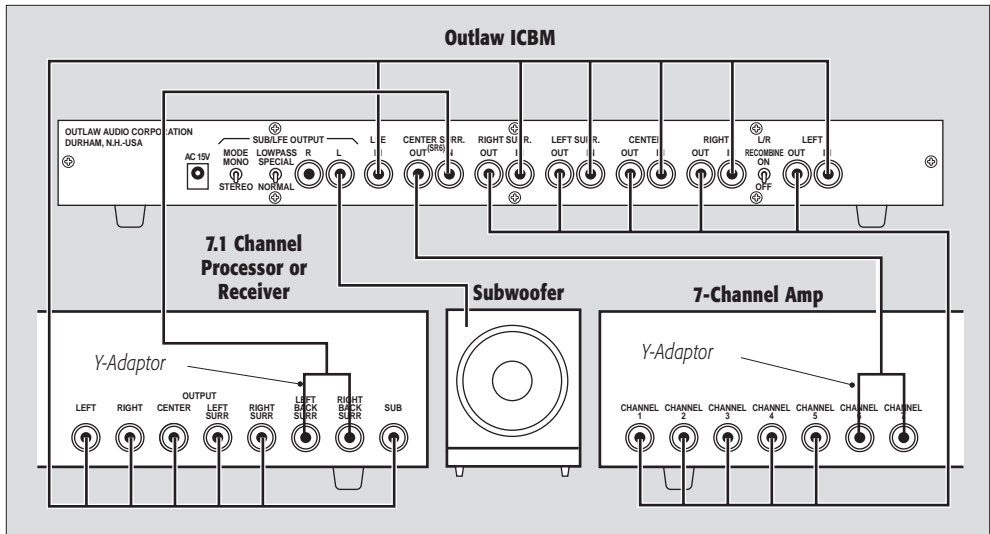
Step 3 **Connect your processor or receiver to the ICBM.**

**For systems with 5.1 (“six channel”) outputs** Connect cables from the five main channel outputs (left/center/right/left surround/right surround) on your receiver or processor to the corresponding inputs on the **ICBM**—left to left, right surround to right surround, and so on (see Figure 2). Do not connect the subwoofer output of your receiver or processor at this time.

**For systems with 6.1 outputs** Connect the cables from the six main channel outputs (left/center/right/left surround/right surround/center surround) on your receiver or processor to the corresponding inputs on the **ICBM**—left to left, right surround to right surround, and so on. Do not connect the subwoofer output of your receiver or processor at this time.

**For systems with 7.1 outputs** Connect the cables from the five main channel outputs (left/center/right/left surround/right surround) on your receiver or processor to the corresponding inputs on the **ICBM**—left to left, right surround to right surround, and so on (see Figure 3). As the output for the “surround back left” and “surround back right” channels is actually a monaural signal, use a short “Y” adaptor to combine the two outputs to a single feed, and then

**Figure 3**  
Using the ICBM  
between a 7.1 channel  
processor or receiver  
and 7 channel  
amplifier



connect the cable to the Center Surround input on the rear of the **ICBM**. Do not connect the subwoofer output of your receiver or processor at this time.

**Step 4 Connect the ICBM to your amplifier.**

Next, connect the output jacks on the **ICBM** to the corresponding input jacks on your amplifier(s). Most amplifiers don't have input labels for all the channels in a 5.1-channel or 6.1-channel system; the channels are often just numbered. So be extra careful to connect each of the **ICBM**'s outputs to the proper amplifier channels.

*Note that for 7.1 systems you will need to connect a "Y" adaptor cable or connector to the Center Surround output jack on the **ICBM**. This is a monaural signal that should be connected to the amplifier channels that feed the Surround Back Left and Surround Back Right channels for your system.*

**Step 5 Connect the ICBM to your subwoofer.**

If you have a powered subwoofer, connect either of the **ICBM**'s subwoofer output to the subwoofer's line-level (RCA) input. If your subwoofer has a "bypass" input make the connection there. If not, set the crossover frequency control on the subwoofer to the highest possible setting. If you have two subwoofers and wish to run them in stereo, connect the **ICBM**'s left subwoofer output to the left subwoofer, and the right subwoofer output to the right subwoofer and set the crossover on the subwoofers as noted above.

If you use tower speakers that contain an internal powered woofer section and an LFE input, and you do not use a separate subwoofer, you may wish to connect the **ICBM**'s subwoofer outputs to the speakers' LFE inputs. This will give you additional fine-tuning capabilities as compared to

using the **ICBM's** Left/Right Recombine switch to route the subwoofer signal into the main left/right speakers. However, using the speakers' LFE inputs requires a more complex connection, and more care in system fine-tuning. Most users will probably prefer to use the **ICBM's** Left/Right Recombine switch and ignore the speakers' LFE inputs.

**Step 6 Plug in the ICBM's AC adapter.**

Connect the small plug at the end of the cord from the **ICBM's** external transformer/power supply into the matching jack on the **ICBM's** rear panel. Plug the transformer/power supply into an AC power source. (Due to the low current draw of the **ICBM** you may safely connect it to the rear panel outlets on a processor or receiver so that it turns on automatically with your system.)

**Step 7 Reconnect your system components to their AC power sources.**

**Step 8 Check your connections.**

Turn your system components on. To make certain that all connections have been made to the proper channels, activate the processor or receiver's speaker balancing "test tone." As the tone circulates among the speakers, check the front panel readout or on-screen display to verify that the sound comes from the channel shown in the indicators. If the sound is comes from the wrong channel at any time, turn off all equipment and re-check the connections between the **ICBM** and your processor or receiver to make certain that the channels are properly matched.

Although the **ICBM** has minimal insertion loss, as it is connected between the output of your receiver or processor and your amplifier, it is a good idea to take this opportunity to use the test tone to re-check the output levels for all channels so that they are equal.

**Step 9 Reset the speaker configuration of your processor or receiver.**

Go to the "setup" mode and set all speakers to "large" and subwoofer to "on." This effectively deactivates the bass management in the receiver or processor and passes that task on to the **ICBM**. Some receivers do not offer an "all speakers large/subwoofer on" setting. In this case, set as many speakers as possible to "large" while maintaining the "subwoofer on" setting. A few inexpensive receivers offer only two bass management modes: "all speakers small/subwoofer on" and "large left/right, small center/surrounds/no subwoofer." If you have one of these, use the latter setting—the **ICBM** will let you use a subwoofer and large front speakers together, an option your receiver doesn't offer!

**Step 10 Set the delay for the surround channels.**

The **ICBM** works best in this application if you set the delay for the surround channels to 0 milliseconds. If your processor or receiver lets you set delays by specifying a certain distance from your listening position to each speaker, set all of the speaker distances the same. (The distance doesn't matter; the usual default of 10 feet will work fine.)



For optimum sound quality, if you set your delay to 0 ms, you should position all of your speakers at the same distance from your listening position. Of course, in some listening rooms, this isn't possible. You can choose one of two options here. In most rooms the best option is set up the delays as you normally would, remembering that it's impossible to set the delays perfectly for more than one listener, anyway! In addition, as both DVD-Audio and multi-channel SACD players do not currently offer delay settings; the delay is only effective in Dolby Digital, Pro Logic (or Pro Logic II), and DTS modes. Even if you use delay for Dolby Digital or DTS, you won't get it for DVD-Audio or SACD. Thus, deactivating delay will probably have a very small effect on the sound quality of your system.

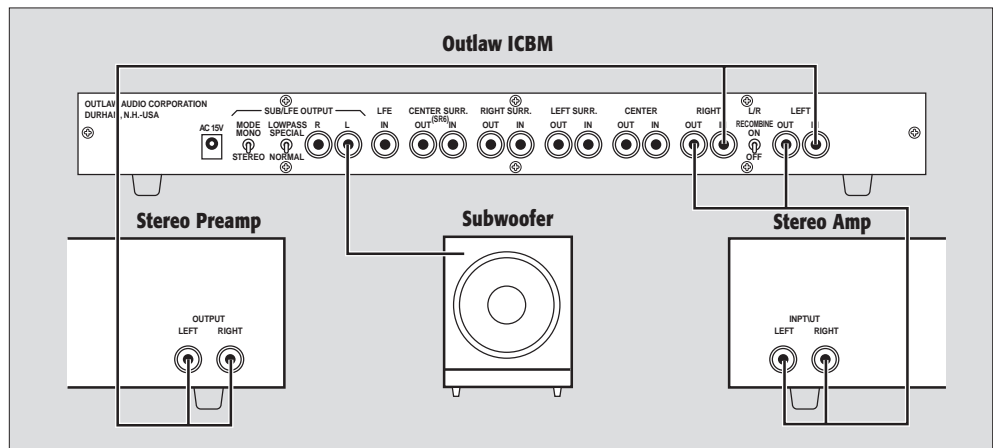
The second option is appropriate if your surround speakers are eight or more feet closer to the primary listening position than the front speakers. In that case you should use the delay settings provided in the receiver or processor. Delaying signals before they reach the bass management circuitry could cause some cancellation effects in the bass, but bass response in a room is typically very uneven, anyway, so it's unlikely you'll notice this effect.

You have now completed the installation of your new **ICBM**. Turn to page 13 for the operating instructions.

### Using the ICBM in a stereo system with a subwoofer

To use the **ICBM** in a stereo system, your system must have either a separate preamp and amplifier, or a preamp output/power amp input on your integrated amp or receiver. We recommend using high-quality, brand-name, shielded audio interconnect cable.

**Figure 4**  
Using the ICBM in a stereo system with a subwoofer



### For systems with separate preamplifiers and power amplifiers:

**Step 1a** **Connect your preamp to ICBM.**

Connect the left and right channel outputs on your preamp to the left and right inputs on the **ICBM**.

Step 2a **Connect the ICBM to your amplifier.**

Connect the **ICBM's** left and right outputs to the left and right inputs of your amplifier.

**For receivers with preamp outputs and main inputs:**

Step 1b **Connect your receiver to ICBM.**

First, remove the jumpers that connect these jacks and save them for future use should you use the receiver at a later date without the **ICBM**. Then, connect the left and right preamp outputs to the left and right inputs on the **ICBM**.

Step 2b **Connect the ICBM to your receiver.**

Connect the left and right outputs of the **ICBM** to the “main in” jacks on the receiver.

**For both options:**

Step 3 **Connect your subwoofer(s).**

If you're using a single subwoofer, connect either of the **ICBM's** subwoofer outputs to the subwoofer's line-level input. Use the subwoofer's “bypass” input or control setting if it has one; if not, use the highest crossover frequency setting your sub provides. If you're using two subwoofers, connect the left subwoofer to the **ICBM's** left subwoofer output, and the right subwoofer to the **ICBM's** right subwoofer output.

Step 4 **Plug in the ICBM's AC adapter.**

Connect the small plug at the end of the cord from the **ICBM's** external transformer/power supply into the matching jack on the **ICBM's** rear panel. Plug the transformer/power supply into an AC power source. (Due to the low current draw of the **ICBM** you may safely connect it to the rear panel outlets on a processor or receiver so that it turns on automatically with your system.)

That's all there is to the stereo connection. Now we'll explain how to set the **ICBM's** controls.

## The Basic Principles of Bass Management

If you were to run your entire system “full range” (i.e. every speaker set to “large,” so they all get everything from 20Hz to 20kHz), the smallest speakers in your system would receive deep bass signals. As a result, you wouldn't hear much of the bass, because small woofers and cabinets can't reproduce it. Any deep bass you did hear from a small speaker would likely sound distorted. Worst of all, extremely low frequencies can damage small speakers.

Bass management is the circuitry you use to direct low frequencies to the speakers best able to handle them. For example, a bass management system can extract low frequencies out of small surround speakers (that aren't designed for deep bass), and either re-direct the bass to a large pair of tower speakers in the front—or send it to a subwoofer.

Bass management circuitry is sometimes called a “crossover,” and the point at which it divides the bass from the other frequencies is called the “crossover point.” You’ll find bass management circuitry built into all Dolby Digital receivers and pre-amp/processors, and into all DVD players which contain on-board internal 5.1-channel Dolby Digital decoders.

Bass management circuitry not only gathers in the low frequencies from all channels and redirects them to where they can be easily reproduced, It also handles the .1 channel. The .1 channel (in a 5.1-channel soundtrack ) is actually a special, additional bass track on Dolby Digital, DTS, DVD-Audio, and multi-channel SACD discs. In many cases, extra deep bass is recorded onto this .1 track, which is normally routed to a subwoofer. But in systems that do not have a subwoofer, you will not hear the .1 bass unless you use bass management circuitry to re-route the bass into the other speakers in the system.

### **So why do you need an ICBM?**

Most of today’s DVD-Audio players, and some of today’s multi-channel SACD players, do not have bass management when you’re playing DVD-Audio or SACD discs. (The players themselves may contain bass management menus, but this built in circuitry is probably effective only when you’re listening to Dolby Digital and DTS soundtracks.)

As a result, when you’re listening to DVD-Audio or SACD discs, all of the speakers get a full-range signal, (with deep bass being sent to all speakers), and the separate “.1” bass track goes only to the subwoofer. Thus, the main speakers in the system may get more bass than they can handle. And in systems without a subwoofer, most of the bass will be thrown away, because it cannot be routed to the other speakers.

The **ICBM** can fix these problems entirely. Connect it between your DVD-Audio or SACD player and your receiver or preamp/processor, and the **ICBM** will put all the bass in the right place. If you have small satellite speakers and a subwoofer, it will keep the bass out of the small speakers and send it all to the subwoofer. If you have large tower speakers and no subwoofer, the **ICBM** will route the “.1” bass from the subwoofer track over to the tower speakers.

Even if your DVD-Audio or SACD player *does* have bass management, it will be much less versatile than the **ICBM**’s circuitry, and thus won’t let you fine-tune your system as the **ICBM** will.

The **ICBM** works not only with 5.1-channel systems, but also with 6.1-channel systems like Lucasfilm THX Surround EX and DTS ES-Matrix and ES-Discrete. We have included an extra channel of bass management to accommodate these systems. That extra channel also lets the **ICBM** work with the 6.0-channel systems now being championed by Chesky Records and others. These systems repurpose two of the channels in DVD-Audio or multi-channel SACD, using the center channel as a left front/side “height” channel, and the LFE channel as a right front/side “height” channel.

### **Do you still need an ICBM if you don’t have DVD-Audio or SACD?**

You might. Unless your receiver or preamp/processor has sophisticated bass management controls, there’s a good chance your bass management isn’t optimized for your speakers. Most receivers and pre/pros have a fixed crossover point at 80 or 100 Hertz, which lies in the upper bass region. That’s fine if you have mid-sized satellite or surround speakers with, say, 6- or 7-inch woofers. But if you’re using

speakers with smaller woofers measuring 4 inches or so, you may find that you lose the bass from 80 Hz to about 120 Hz, because the smaller woofer can't reproduce it. In this case, you'd want a higher crossover point (around 120 Hz).

Alternatively, if you're using smaller tower speakers and a subwoofer, the small tower speakers will probably distort when you feed them a signal with deep bass—yet using an 80 or 100 Hz crossover point with these speakers wastes the bass capability that they do have. You may also find that these speakers do a better job of reproducing upper bass, in the 50 to 100 Hz range, than a large subwoofer will. In this case, you'd want a lower crossover point—around 40 or 60 Hz depending on the size of the tower speakers.

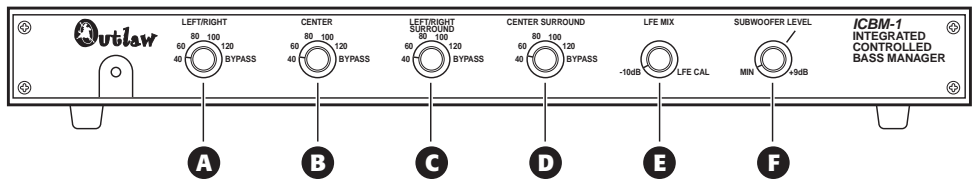
The **ICBM** offers crossover points at 40, 60, 80, 100, and 120 Hz, so you can perfectly optimize your bass management to get the best performance from your speakers. In this case, you wire the **ICBM** between your pre/pro and your amplifiers. Using the **ICBM** with a receiver in this fashion requires use of separate amplifiers, or that the receiver include a full set of “preamp out/power amp in” connections. Consult your receiver manual for more information.

### **Do you still need an ICBM if you only have a stereo system?**

If you're using a subwoofer, then yes, you do! The **ICBM** gives you far more adjustability than the crossovers built into subwoofers do, so you can fine-tune your bass response to perfection. You can set the crossover point where it's perfect for your speakers, and you can even drive two subwoofers in stereo.

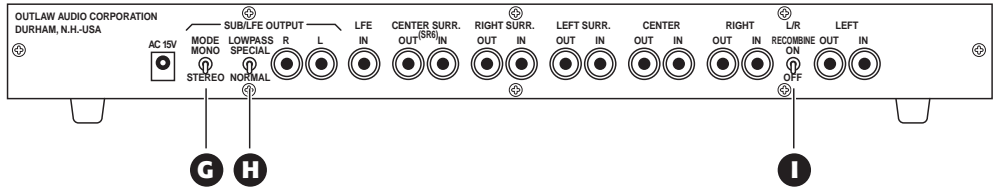
## **The ICBM's Controls**

**Figure 5**  
ICBM front panel



- A** Left/Right Front Channels Crossover Frequency Control – sets frequency at which bass will be filtered out of left/right front channels and redirected into subwoofer
- B** Center Front Channel Crossover Frequency Control – sets frequency at which bass will be filtered out of center front channels and redirected into subwoofer or front left/right channels
- C** Left/Right Surround Channels Crossover Frequency Control – sets frequency at which bass will be filtered out of left/right surround channels and redirected into subwoofer or front left/right channels
- D** Center Surround/SR6 Crossover Frequency Control— sets frequency at which bass will be filtered out of center surround channel and redirected into subwoofer or front left/right channels
- E** LFE Mix Control – sets level of LFE signal relative to other signals
- F** Subwoofer Level Control – sets level of subwoofer output

**Figure 6**  
ICBM rear panel



- G** Subwoofer Mode Mono/Stereo Switch – selects mono feed to all subwoofers, or provides stereo feed for separate left and right subwoofers
- H** Lowpass Special/Normal Switch – selects normal (12 dB/octave), or special 36 dB/octave lowpass crossover for subwoofers requiring a steeper filter curve
- I** L/R Recombine On/Off Switch – redirects bass out of all channels not set to bypass, and into front left/right channels. Does not deactivate subwoofer.

**Note:** Operation of this switch is somewhat counter-intuitive. Please read "Setting the Left/Right Recombine switch" on page 14 before using this option.

## Setting the ICBM's Controls

It's easy to adjust the **ICBM** for your system. You just set the proper crossover point for each of your speakers, set a couple of configuration switches, and then fine-tune the bass performance with the LFE Mix and Subwoofer Level controls. Here's how to do it. . . .

### Setting the crossover points

First, you will need to determine the best crossover point for each of your speakers. If you know each speaker's rated  $\pm 3$  dB frequency response, you can use that. Whatever the speaker's rated bass extension is, add about 10 Hz to that number, then set the **ICBM's** crossover for that channel at the next highest number. For example, given a speaker rated at 55 Hz – 20 kHz,  $\pm 3$  dB, take the 55 Hz number and add 10 Hz to get 65 Hz. The next highest setting on the **ICBM** is 80 Hz, so that's the setting you should start with. Listen carefully to the bass at that setting, then try the next lowest setting (in this case, 60 Hz) and give another listen to the same material. You may notice better bass definition. Or you may notice more distortion. Use whichever setting yields the best overall bass fidelity.

If you don't know your speakers' rated frequency responses, here's a guide to typical bass management settings for several common speaker types:

Speaker Type	ICBM Setting
Large tower speaker with one 12- or 15-inch woofer, or two 10-inch woofers	<b>Bypass or 40 Hz</b>
Small tower speaker with one 10-inch woofer or two 8-inch woofers	<b>40 Hz</b>
Small tower or large bookshelf speaker with one 8-inch woofer or two 6-inch woofers	<b>60 Hz</b>
Bookshelf speaker with one 6-inch woofer or two 5-inch woofers	<b>80 Hz</b>
Bookshelf speaker with one 5-inch woofer or two 4-inch woofers	<b>100 Hz</b>
Satellite speaker with one 4-inch woofer or one or two 3.5-inch woofers	<b>120 Hz</b>

Cabinet size and tuning also affects bass response, so you should experiment with the settings to make sure they sound best for your system. If you hear too much bass distortion, listen closely to the different speakers in your system to see which ones are distorting, then try raising the crossover point for those speakers by one or two notches. If the bass sounds poorly defined, try lowering the crossovers for the larger speakers in your system by one notch.

### **Setting the Left/Right Recombine switch**

**Note:** *In order to make the ICBM as versatile as possible, we had to make the operation of this switch somewhat counter-intuitive. Please read over the following carefully before using the Left/Right Recombine switch.*

The Left/Right Recombine switch redirects the bass into the front left and right speakers. You should definitely set this switch to “on” if you do not use a subwoofer.

However, we have designed the **ICBM's** circuits so that you can still use a subwoofer with the Left/Right Recombine switch activated. The reason we did this is that even if you have fairly large front left and right speakers, you may want to route some of the front left/right signal to the subwoofer to reinforce the bass output from those channels.

If you connect a subwoofer with the Left/Right Recombine switch on, and, if you want bass **also** going to the subwoofer, **you must set the Left/Right Front Crossover Frequency control to any setting other than “bypass.”** For example, if you have large front speakers, and set the crossover point for them to 80 Hz (or any other frequency other than “bypass”), the front speakers will actually continue to get a full range signal. (The bass is first removed from the front speakers and then sent right back to them.) What the crossover control is actually doing is setting what frequencies will **also** travel on to the subwoofer. As a rule of thumb, setting this control at 80 Hz is a safe bet. If you are using a very large (15 or 18-inch) subwoofer, you may find that setting this control at 60 or 40 Hz gives you somewhat better bass definition.

We know this concept is a bit tricky to comprehend, but it is the simplest explanation we can give to a very sophisticated electrical manipulation.

### **Setting the Subwoofer Mode Mono/Stereo switch**

The Subwoofer Mode Mono/Stereo switch lets you use two subwoofers for a stereo effect. Although bass is generally non-directional, some critical listeners feel that having two subwoofers set up in stereo yields better sound than setting up multiple subwoofers and feeding them the same signal.

When the stereo switch is activated, the **ICBM** gathers all low bass from the right front, right surround, and one-half of the bass from the center channel and center surround channel and places it with the right subwoofer output. Conversely, everything from the left front, left surround, and one-half of the center and center surround are channeled to the left subwoofer output.

From a technical standpoint, both mono and stereo approaches have their pluses and minuses. If you use the **ICBM** with two subwoofers, you should experiment setting this switch both ways to see which

sounds the best to you. *(As a side note, we fully expect the advantages of mono versus stereo subs with the ICBM to be a lively topic of debate on Internet chat rooms. After all, the Outlaws are already arguing among themselves as to which way sounds better.)*

### **Setting the Low pass Special/Normal switch**

The Low pass Special/Normal switch lets you change the slope of the subwoofer crossover from the “normal” 2<sup>nd</sup> order (12 dB/octave) response to the “special” 6<sup>th</sup> order (36 dB/octave) response. With most powered subwoofers, the “normal” setting will work best. However, some subwoofers—particularly THX<sup>®</sup>-certified models — are designed to be used with high-order crossovers. If you have a THX-certified subwoofer, use the “special” setting. If you use a subwoofer that is not THX-certified, try flipping the switch both ways to see which sounds best.

### **Setting the LFE Mix control**

The LFE Mix control lets you lower the level of the “.1” LFE signal by up to 10 dB. Normally, you should leave this control set full up, at the 0 dB setting. But many 5.1-channel programs have LFE tracks that some listeners find overwhelming. If your system sounds good with most discs, but certain discs sound too bassy, try lowering the LFE level for those discs.

This control does not affect the bass content of the other channels, so it will not affect the fundamental balance and tonal quality of your system.

### **Setting the Subwoofer Level control**

This control lets you fine-tune the balance of your subwoofer with your other speakers. You can boost the subwoofer by up to 9 dB, or completely turn it down. You may find that with certain program material, kicking the subwoofer up a couple of decibels (or pulling it down a few dB) gives a more satisfying effect. This control works like the level control on a powered subwoofer, except that it offers a more limited range of adjustment for greater precision.

When you calibrate your system using the internal test tones in your receiver or preamp/processor, set the ICBM's Subwoofer Level control to 0 dB and use the level control in the receiver or pre/pro, or the control on the subwoofer, to set the level so it's equal to that of the other channels. Now you can use the Subwoofer Level control on the ICBM for fine-tuning. You'll find it easier to access than the controls on the subwoofer or in the pre/pro or receiver. Whenever you want to return to a “by the book,” reference setting for your subwoofer level, just set the ICBM's Subwoofer Level control back to 0 dB.

If you're using the ICBM in a stereo system, you can set the Subwoofer Level control by ear, using music or movies, or you can use a CD with test tones, such as *Stereophile* Test CD 1, along with an SPL meter. Play a test tone at about 500 Hz, and observe the reading on your SPL meter. Now play a test tone below the lowest crossover frequency you're using on the ICBM. (For example, if your lowest crossover setting on the ICBM is 60 Hz, use a test tone in the 40 to 50 Hz range.) Adjust the ICBM's Subwoofer Level control so that the level is the same on the bass tone as it was on the 500 Hz tone.

# Troubleshooting

## Problem

## Solutions

### No sound

Make sure the ICBM is receiving power. If the pilot light on the front panel is not glowing, make sure the AC adapter is plugged into the wall socket and into the ICBM.

Make sure the program source device (DVD-Audio, SACD, etc.) is turned on and playing.

Make sure the amplifiers and receiver or pre/pro are turned on.

### Intermittent sound

Check the cables by lightly wiggling them. If sound is "crackly" or cuts in and out when you wiggle a cable, replace the faulty cable.

Remove the ICBM from the signal chain. If the problem persists, it's in one of your other components. Check your owner's manual for that component for troubleshooting tips.

### No bass when using a subwoofer

Make sure the subwoofer power is turned on and its level control is turned up, and also make sure the ICBM's Left/Right Recombine switch is set to "off."

Make sure the ICBM's Subwoofer Level control is turned up.

Check to make sure cables for LFE and subwoofer are connected.

### No bass when using large left/right speakers and no subwoofer

Make sure the ICBM's Left/Right Recombine Switch is set to "on."

### No upper bass ("hole" between the subwoofer and satellites)

Make sure the subwoofer's own crossover control is bypassed or set to the highest possible frequency.

Try turning the crossover points for the larger speakers in your system down one notch.

## Specifications

### Inputs

All unbalanced, -10 dBV, chassis-mounted RCA jacks

Left, center, right, left surround, right surround, center surround (SR6), LFE

### Outputs

All unbalanced, -10 dBV, chassis-mounted RCA jacks

Left, center, right, left surround, right surround, center surround (SR6), left subwoofer, and right subwoofer

### Controls

Crossover frequency selectors for left/right front, center, left/right surround, center surround (SR6); potentiometer controls for LFE mix and subwoofer level;

Switches for L/R recombine, subwoofer mono/stereo, and low pass special/normal.

### Crossover frequencies

40, 60, 80, 100, 120 Hz, and bypass

### Filter slopes

2<sup>nd</sup>-order Butterworth high-pass in both "normal" and "special" modes

2<sup>nd</sup> order Butterworth low-pass in "normal" mode; 6<sup>th</sup>-order Butterworth low-pass in "special" mode

### LFE mix range

0 dB (unity gain) to -10 dB

### Subwoofer level control range

Full attenuation to +9 dB

### Signal-to-noise ratio (A-weighted)

105 dB

### Total harmonic distortion plus noise

less than .015 %

### Relative phase shift channel to channel

less than 1 degree

### Relative phase shift low-pass output to high-pass output

less than 1 degree

### Maximum input voltage

4.5Vrms

### Maximum output voltage

9.5Vrms

### Gain

0dB (unity)

### Power supply

(AC adapter supplied): 15VAC -300mA

### Dimensions

44 x 440 x 175 mm (HxWxD) 1.76 x 17.6 x 7 in. (HxWxD)

