

# **ACTIVE-BALANCED SERIES**

## **Installation and Operation Manual**

### **BVD-30™**

**Active Balanced Driver**

for Component Video/Analog Audio and Control Signals

### **BVR-30™**

**Active Balanced Receiver**

Wall Mountable Component Video/Analog Audio Receiver

**T**hank you for choosing an AudioControl Active-Balanced product for your video and audio distribution needs. You are installing some of the most innovative custom installation products available. These units will allow you to transmit and receive hi-definition component video, three channels of analog audio plus four control signals over dual Category 5 wires using AudioControl's high quality active circuitry. Please note that these products are primarily designed for installation by professional audio video companies. Therefore if any part of this manual is not clear ... STOP WHAT YOU ARE DOING! Contact your nearest audio video installation company or call us and we will refer you to one. Plasma monitors, projectors and some DVD players are too expensive to damage so don't attempt anything you are unfamiliar with.

Now sit back, grab yourself a cold beverage and take a moment to read through this manual before you charge off into the installation. Remember, once you or your Custom Installation specialist cuts a hole in the wall in the wall, you are committed.

# **ACTIVE-BALANCED SERIES**

## **Active Balanced Video and Audio Products**

Here are some of the cool features of your new Active Balanced Sender and Receiver units using dual Cat-5 wires:

- Extends Highest-Quality Component Video, analog audio and control signals up to 1000 feet (305 meters)
- Uses dual standard, inexpensive, twisted-pair Cat-5 cables
- Utilizes AudioControl's Active Balanced Technology for maximum audio and video performance with minimal electrical interference
- Pass through inputs and outputs for extending control signals such as IR, serial commands or low voltage power
- High Video Bandwidth - Compatible with all 480, 720, and 1080 Formats
- Audiophile quality analog audio performance
- Video signal sensing 12 volt output trigger
- Standard EIA-568 RJ-45 Cat-5 connection jacks
- Adjustable level controls, image compensation and gain circuits
- Five Year Warranty and built in the USA  
(not in some far away country)

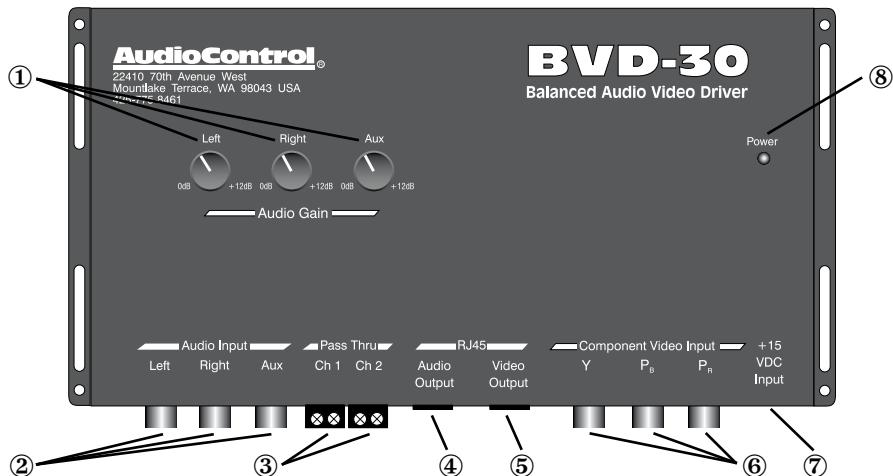


# **ACTIVE-BALANCED SERIES**

## **Before You Begin**

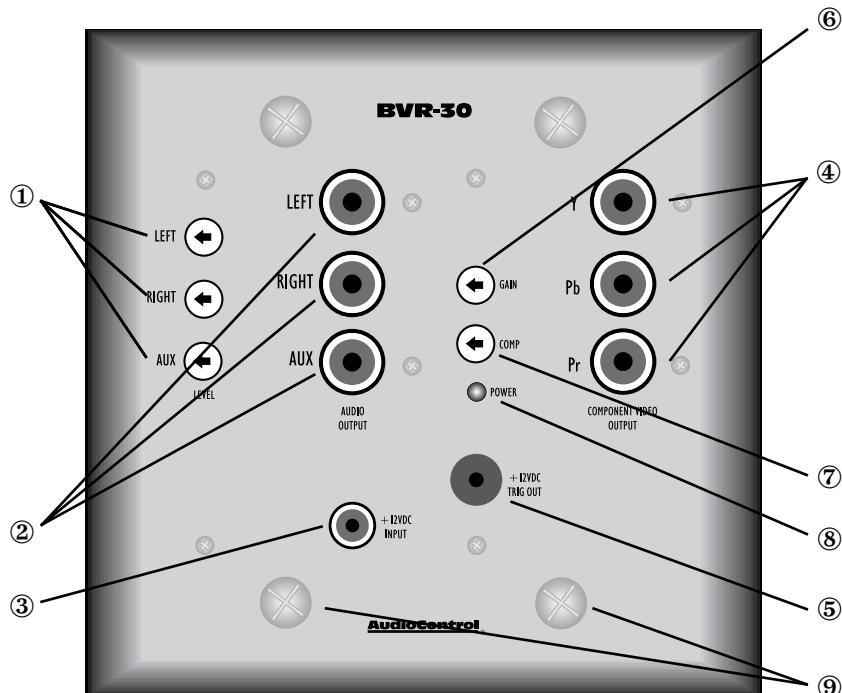
For the best product performance and the lowest use of painkillers, nothing is better than a well-planned professional system installation. Before you start pulling wires and punching holes in the walls, sketch out a full layout of the complete system. This will help plan the wire routing and minimize the “gotchas” later on.

## **A Quick Tour of the BVD-30 and BVR-30**



- ① Analog Audio Gain Controls
- ② Analog Audio Inputs
- ③ Control Signal Pass Through
- ④ RJ-45 Audio Outputs
- ⑤ RJ-45 Video Outputs
- ⑥ Component Video Inputs
- ⑦ Power Connector
- ⑧ Power Light

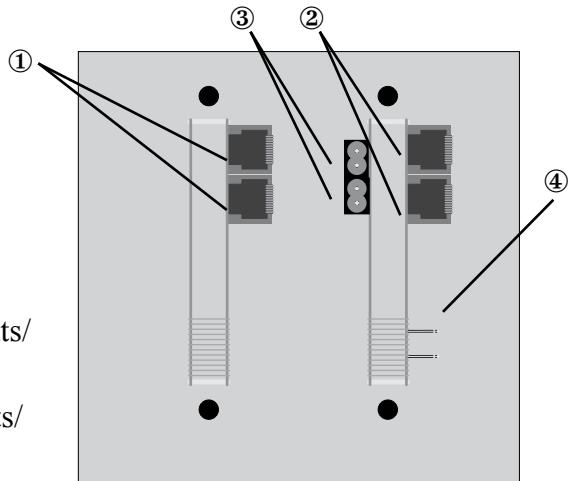
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*Front view of the BVR-30*

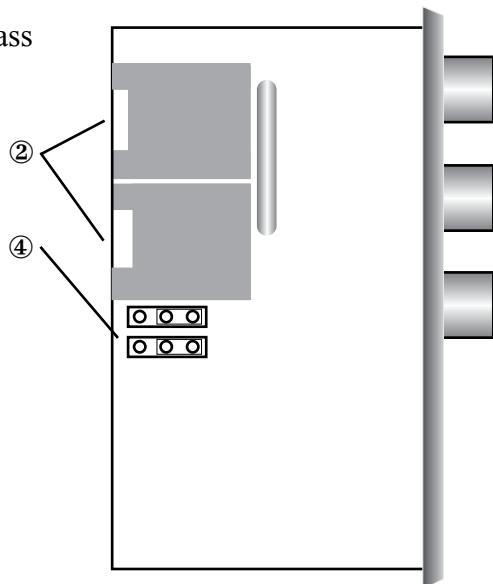
- ① Analog Audio Output Levels
- ② Analog Audio Outputs
- ③ 12 VDC power input
- ④ Component Video Outputs
- ⑤ 12 Volt Trigger output
- ⑥ Video Signal Gain Control
- ⑦ Image Compensation Control
- ⑧ Power Light
- ⑨ Mounting Screws

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- ① RJ-45 video inputs/outputs
- ② RJ-45 audio inputs/outputs
- ③ Control signal pass through
- ④ Auxilliary audio/pass through selector

*Rear view of the BVR-30*



*Side view of the BVR-30*

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## **BVD-30 Installation Information**



The small size and low power draw of this unit allows it to be mounted in almost any dry, indoor location. Pick a mounting location close to the audio or video components that will be connected to the BVD-30.

This keeps the unbalanced audio and video signal cables as short as possible since they are much more susceptible to noise pickup than the balanced Cat-5 cables. There is no heat build-up problem, so it is okay to put the BVD-30 in a closed area. Just remember you need to at least be able to reach the unit.

### **Power Wiring**

The BVD-30 operates from the provided 15 volt VDC wall plug transformer. Additionally, if the Cat-5 wiring between the BVD-30 and BVR-30 is less than 200', the BVD-30 will also provide power to the BVR-30. For longer distance, you will want to use the supplied wall power supply that comes with both units.

### **Signal Wiring**

The BVD-30 and BVR-30 operate using dual standard unshielded twisted-pair (UTP) Category 5 wiring. Good wiring practices will minimize the chance of any noise pickup.

- Do not run the signal cables parallel to AC power wiring.
- If you need to cross over a power wire, do so at right-angles.
- Keep the signal wiring as far as possible from any noise sources such as lighting power supplies, fluorescent lights, motors, etc.

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## Selecting The Pass-Through and Analog Audio Connections

The BVD-30 and BVR-30 can be configured in 2 different ways for optimum use of the CAT-5 wiring connecting them:

**Configuration 1:** Three analog audio signals plus one pair of pass-through connections for control signals. Channel 1 Pass Thru input is **not** active.

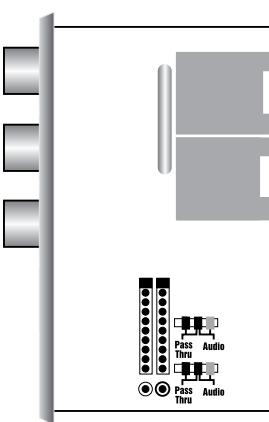
**Configuration 2:** Two analog audio signals plus two pairs of pass-through connections for control signals. The Auxiliary Analog Audio input is **not** active.

You can select which configuration will work the best for your system by changing internal jumpers on both the BVD-30 and the BVR-30.

	<i>Config 1</i>	<i>Config 2</i>
<i>Jumper Settings on BVD-30 and BVR-30</i>	“Audio”	“Pass Thru”
<i>Audio Channels</i>	<i>3 pairs</i>	<i>2 pairs</i>
<i>Pass Through Connections</i>	<i>2</i>	<i>4</i>



BVD-30 Undercover Jumper



BVR-30 Side View

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## **Analog Audio Channels**

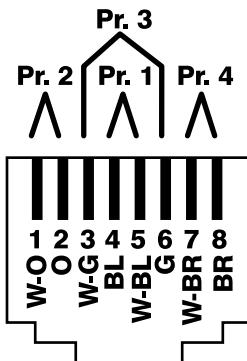
Depending upon your configuration, you can use these channels to distribute up to three high quality analog audio signals for the left, right, and auxiliary (center or subwoofer are good options). The BVD-30 has input gain to adjust these signal levels for optimum sound quality.

## **Pass Thru Inputs and Outputs**

The BVD-30 has Pass-Thru inputs that can accept 2 or 4 wires and will literally Pass-Thru these signals unprocessed to the BVR-30. See the configuration options on the previous page to assist you in making the proper settings. You can use these Pass-Through connections to send controls signals such as IR or serial control over the dual Cat-5 wires. Keep in mind these connections are strictly Pass-Through meaning they have no extra gain, buffering or processing and are straight wire connections. Therefore you will want to make sure that the signals you send and receive are capable of operating properly over the long distances that your BVD-30 and BVR-30 are running.

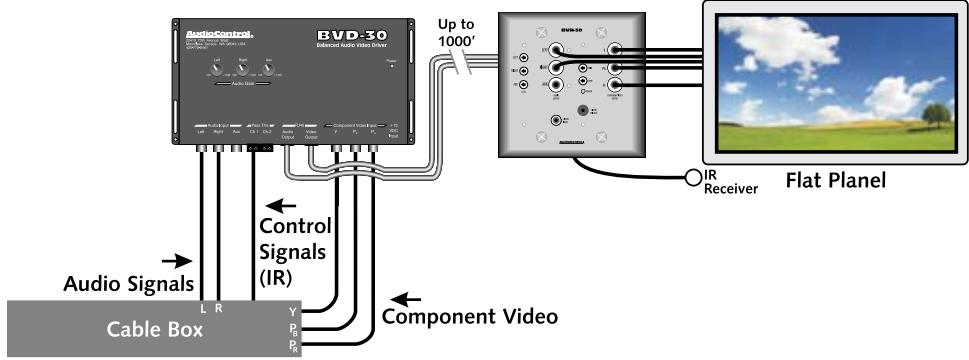
## **Cat-5 Wiring:**

The RJ-45 connections on the BVD-30 and BVR-30 conform to the EIA-568B standard. This is the same Cat-5 cable wiring standard that a typical computer network utilizes. You can use any existing 10/100 Base T network cabling and patch bays in an installation as long as it does not run through a router or hub. The Cat-5 wiring must run directly from the BVD-30 to the BVR-30.

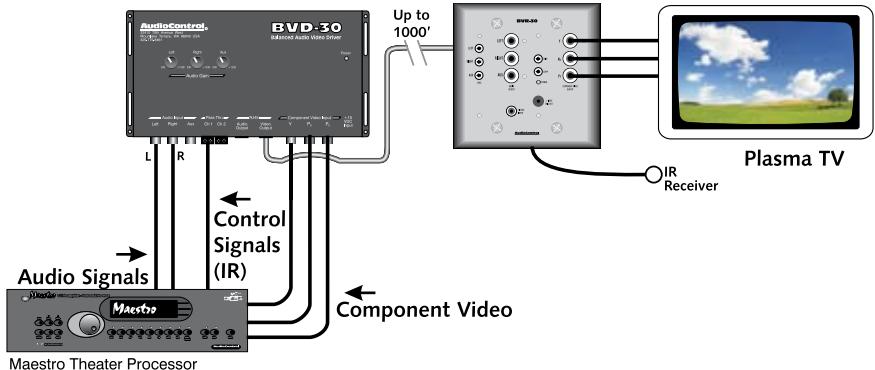


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## System Diagrams



**System 1:** DVD player sending component video, analog audio, and IR over cat 5



**System 2:** Theater processor sending component video and stereo audio to video projector/plasma via BVD-30 and a BVR-30

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## **BVR-30 Installation Information**



The small size and low power draw of this unit is perfect for mounting in almost any dry, indoor location, specifically a double gang J-box (not provided). Pick a mounting locations close to the audio or video components that will be connected to the BVR-30. You will want to keep the unbalanced audio and video signal cables as short as possible

since they are much more susceptible to noise pickup than the balanced Cat-5 cables. Just remember you need to at least be able to reach the unit with a small screwdriver to make any final adjustments

### **Video Wiring**

The BVD-30 and BVR-30 have 3 high-bandwidth inputs and outputs that are capable of extending component video signals (3 connectors, Y, PB, PR)

*Note: You cannot split or “Y-off” the video signal coming out of your BVD-30 into multiple BVR-30s as the signal will be compromised.*

### **Power Wiring**

The BVR-30 operates with a 110 VAC to 12 volt DC wall plug transformer (provided) that is terminated with a 5 mm jack that will plug into the front panel. We have conveniently labeled this jack “+12VDC Input”. *Please note that the 12 volt supply transformer provided with the BVR-30 is different than the power supply that is used with other AudioControl Active Balanced line products. Therefore, be careful to not use the wrong power supply.*

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## **Remote Powering the BVR-30 via CAT-5**

The BVR-30 can receive power over the CAT-5 cable (Blue and Blue/White) from a BVD-30 or an AudioControl Maestro M2e theater processor. If the cabling is over 200 feet, we recommend that you utilize the supplied power supply (12 VDC/500ma) to offset any power loss from the long CAT-5.

## **Grounding**

The BVR-30, like all AudioControl balanced line products, is designed to offer maximum isolation from radiated signals that can creep into the video signal path and make your pictures look funny (we are not talking about "Ha Ha"). By design the BVR-30 has high input impedance to ground, which minimizes the ground loops that can appear in a coax wired system. However, we recommend that you always make sure the structure you are in is wired to the National Electrical Code. The NEC standards require all ground wires to run back to the main panel prior to termination. We now return you to your regularly scheduled manual text...

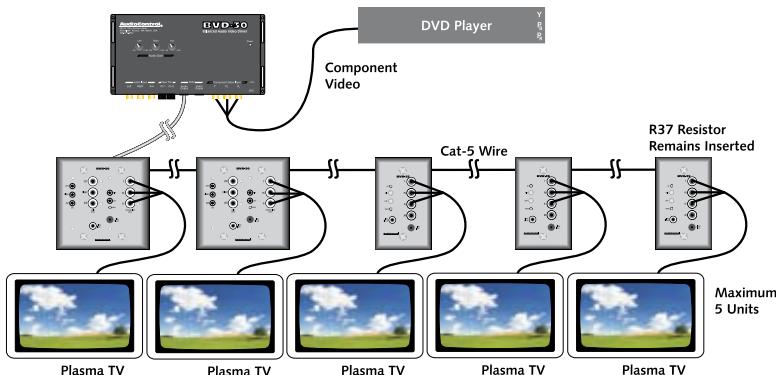
## **12 Volt Output Trigger**

The BVR-30 is equipped with a unique video signal sensing circuit that output a constant 12 volts (100ma) which can be used to trigger remote mounted projectors, activate a lift, lower a screen or trigger other automation products. The presence of any Component (Y) or Composite video sync signal at the RJ-45 inputs to the BVR-30 produces a sustained +12VDC on the tip of the Video Trigger Jack.

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## **Daisy Chaining Multiple BVR-30's**

The BVR-30 has the ability to receive video and audio signals over CAT-5 and then route them on to five (maximum) BVR-30's. This allows for wiring in a daisy chain format rather than the star method. If you are using your BVR-30 in this manner you need to remove the blue "termination resistor network" from the socket on the rear of the video circuitry of the BVR-30. The last BVR-30 or BVR-25 in the signal path MUST have the "R37" resistor network inserted for the system to function properly.



**System 3:** Video signal being fed in BVD-30 and routed to multiple BVR-30's via daisy chain wiring

## **Adjusting the Video Controls**

Properly setting the controls on your BVR-30 will always give you the maximum performance. Although the unit does come "pre-set" from the factory with many of the internal enhancements at optimum levels, we have no way of knowing the exact length of cable that you will be using. Therefore, we have provided a few simple controls to assist you in the optimization of the system:

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**Gain:** Simply, this control on the BVR-30 adjusts the output level or gain on the component video connections. Typically GAIN calibration can be made by turning on the processor's OSD function which will most often display either white on a black background or vice versa. An ideal signal for calibration is a fixed image that is 50% white and 50% black such as a "needle" or "checkerboard" pattern that comes with many video test generators. Adjusting the gain control will raise or lower the white levels. While this procedure will not replace a high level ISF type video calibration, it is a good starting point.

**Image Compensation:** The Image Compensation control on the BVR-30 equalizes the video signal to counteract the effect of wire capacitance. In most cases the COMPENSATION control should be set the same as the GAIN control. If the GAIN control is set to the "5 o'clock" position, the COMPENSATION control should be set the same. If the image still appears to be too soft or too edgy, further adjusting can then be done.

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## **Troubleshooting**

### **“No Picture or Sound.”**

1. Confirm that Audio and Video Cat-5 wires are connected properly.
2. Make certain the Power lights on both the BVR-30 and BVD-30 are illuminated.
3. Verify that the RJ-45 termination on both ends of the Cat-5 is correct. We all know this is easy to get wrong. Use an RJ-45 cable tester to verify.
4. Make certain the Cat-5 cable run does NOT go through an Ethernet Router or hub. It is alright to run the signal through a passive patch bay.
5. Make certain the display or monitor is compatible with format of choice, i.e. 480Y; 1080i; etc.

### **“No Power Light.”**

1. Confirm that you are using the proper power supplies for the BVD-30 and the BVR-30. Do the outlets have power?
2. If the units are powered via Cat-5 from either the sender or receiver, make sure the cable length is less than 200'. Use supplied power supplies if necessary.

### **“Horizontal bars across the screen”**

1. Check the power grounding of the display device, the video processor, satellite dish, cable box, and all components in the video signal path. They should all be grounded back at the electrical panel, not locally.
2. Make sure that the CAT-5 wiring going into your BVR-30 is not running parallel with any high voltage AC systems.

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## **“Video picture scrambled or colors incorrect”**

1. Confirm that the “Y”, “PB”, and “PR” connections are correct.
2. Check the Cat-5 wire configurations. Use an RJ-45 cable tester.
3. Readjust cable compensation settings.

## **“Picture is fuzzy or edgy.”**

1. Adjust the Cable Compensation control on the BVR-30. This compensates for the increased capacitance on longer Cat-5 cable runs and sharpens the video image. Too much compensation will cause image distortion.
2. Confirm the cable length. It is important to note that the BVR-30 was designed for cabling no longer than 1000' for standard component video or 300' for a High Definition signal.

## **“There is hum in the audio signal.”**

1. Verify that the Cat-5 cable is properly terminated on both ends.
2. Make certain that the system is wired with CAT-5 twisted-pair cabling.
3. Make certain there are not any cuts, pinches, or sharp twists in the wiring, allowing a conductor to short to ground (i.e. shield, conduit, cold water pipe, plenum).

## **“No +12 volt trigger output”**

1. Measure output with voltmeter.
2. Confirm amperage required for automation system. Install relay if necessary.
3. The video signal feeding the BVR-30 is too low or uncalibrated. Re-adjust gain and calibration controls.

## **“My ice maker is making a funny noise”**

Frankly, we have no idea.

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*And now, a word from the legal department...*

## **CONDITIONAL FIVE YEAR WARRANTY**

Custom electronics installations are an invisible element of many modern homes. You don't appreciate what they do for you unless something goes wrong. AudioControl recognizes this fact and engineers the most bulletproof components we know how. We stand behind that quality, with a full FIVE YEAR parts and labor factory warranty when our components are installed by an authorized AudioControl dealer in the United States. Otherwise your warranty is one year. You will be happy to know that our warranty returns are rigorously tracked and very few of the units we build ever need to be repaired.

"Conditional" doesn't mean anything ominous. The Federal Trade Commission tells all manufacturers to use the term to indicate that certain conditions have to be met before they'll honor the warranty. If you meet all of these conditions, we will warrant all materials and workmanship on your AudioControl Active Balanced product for FIVE YEARS from the date you bought it, and we will fix or replace it, at our option, during that time.

Here are the conditional conditions:

1. A completed warranty card must be returned to us within 15 days after signing off on the products installation.
2. A sales receipt is required for proof of purchase showing when and from whom the unit was bought. We're not the only ones who require this, so it's a good habit to get into with any major purchase.
3. Your AudioControl product must have originally been purchased from or installed by an authorized AudioControl professional. This warranty is transferable. You do not have to be the original owner, but you do need a copy of the original sales slip.

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4. You cannot let anybody (A) who isn't: the AudioControl factory or (B) somebody authorized in writing by AudioControl, service your product. If anyone other than (A) or (B) messes with your AudioControl product, that voids your warranty.

5. The warranty is also void if the serial number is altered or removed, or if the unit has been used improperly. Now that sounds like a big loophole, but here is all we mean by it:

Unwarranted abuse is: (A) physical damage (don't use your AudioControl product to play fetch with your dog or hlevel your kitchen table, jack up your car or keep the rain off your head); (B) improper connections (120 volts into the power jack can fry the poor thing); (C) sadistic things. This is the best product we know how to build, but if you mount it to the filter pump of a hot tub, something will probably go wrong.

Assuming you conform to 1 through 5, and it really isn't all that hard to do, we get the option of fixing your old unit or replacing it with a new one.

## **Legalese Section**

This is the only warranty given by AudioControl. This warranty gives you specific legal rights that vary from state to state. Promises of how well your BVR-30 will perform are not implied by this warranty. Other than what we have covered in this warranty, we have no obligation, express or implied. Also, we will not be obligated for direct or indirect consequential damage to your system caused by hooking up the AudioControl BVR-30.

Failure to send in a properly completed warranty card negates any service claims.

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## **Repair Information**

In the unlikely instance that you ever need to have your AudioControl component repaired. Please contact our factory for return instructions. Repairs are handled quickly at our factory. You are responsible for paying the freight charges to our factory. If your unit is under warranty, we'll ship it back to you the same method that you sent it into us. Please make certain that you include a note stating the problem with the unit (you'd be surprised how many people forget that) along with your name, return shipping address and a daytime telephone number.

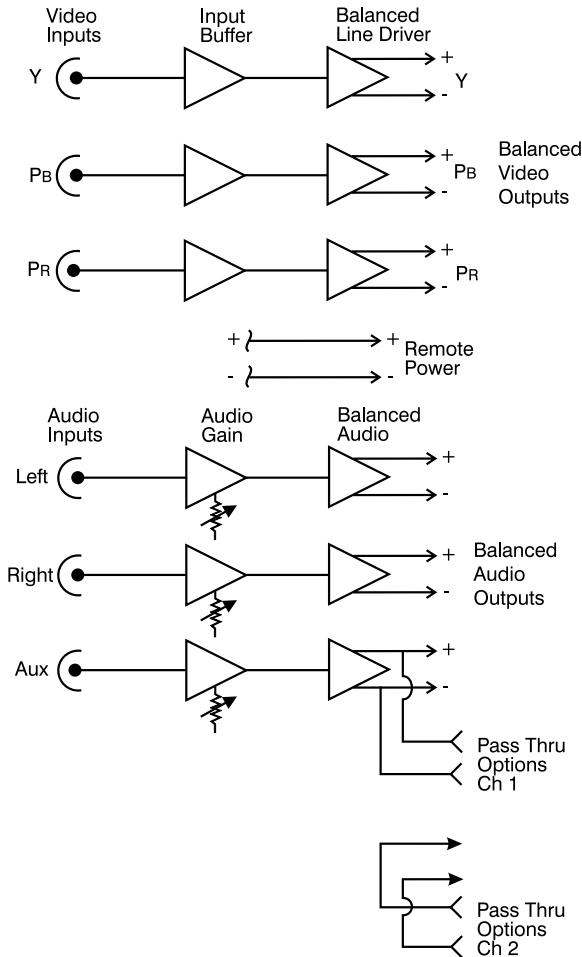
Our Repair Address is:

AudioControl  
Attn: Service Department  
22410 70th Avenue West  
Mountlake Terrace, WA 98043 USA  
Phone 425-775-8461



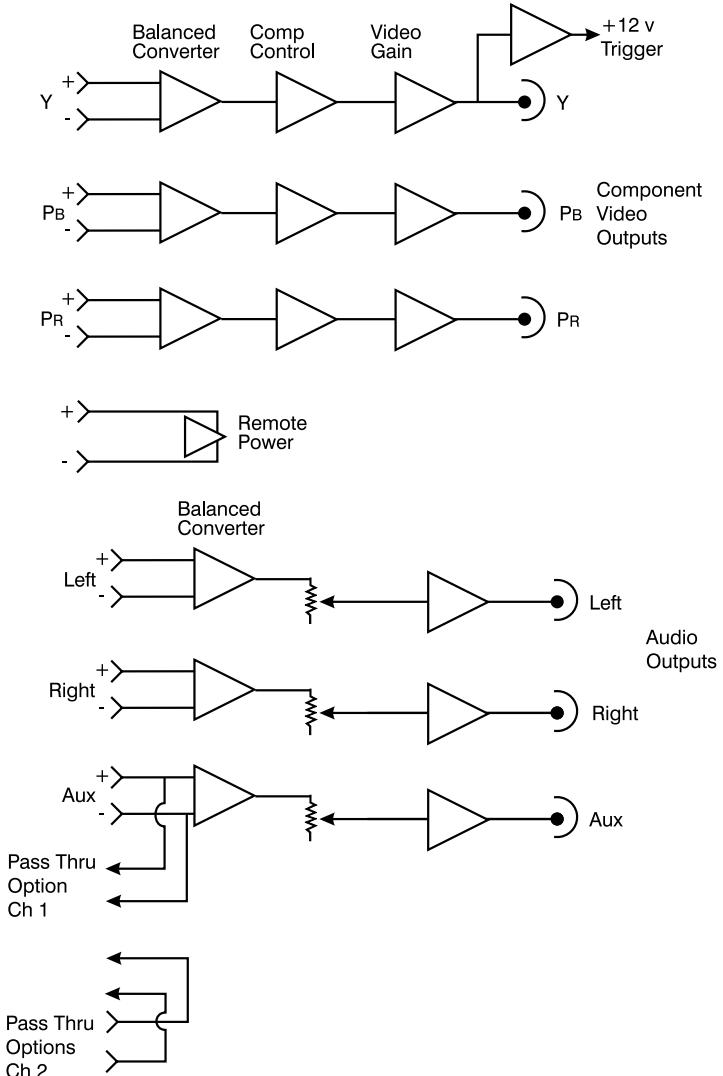
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## **Block Diagrams BVD-30**



# **ACTIVE-BALANCED SERIES**

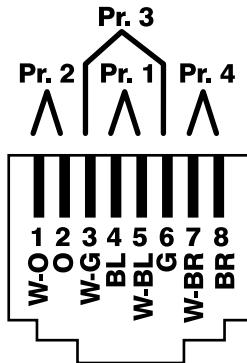
## **Block Diagrams BVR-30**



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## **EIA-568 RJ-45 Pin Connection Diagram**

- Pair 1 White-Blue (W-BL) Video 4 – : Audio/Video  
Blue (BL) Video 4 + : Audio/Video
- Pair 2 White-Orange (W-O) Video 1 + : Component Y  
Orange (O) Video 1 – : Component Y
- Pair 3 White-Green (W-G) Video 2 + : Component P  
Green (G) Video 2 – : Component PB
- Pair 4 White-Brown (W-BR) Video 3 + : Component PR  
Brown (BR) Video 3 – : Component PR



# **ACTIVE-BALANCED SERIES**

## **BVD-30 and BVR-30 Performance Specifications**

All specifications are measured with supplied 110 VAC to 12 VDC wall transformer and . As technology advances, AudioControl reserves the right to change our specifications, like our weather.

### **Video Specifications**

Video Channels	Component
Video Bandwidth	150 MHz @ -3 dB
Video formats supported	480, 720, and 1080
Component Video Connections	RCA
Video Slew Rate	1500 V/uS
Balanced Video Input Impedance	100 ohms
Video Output Impedance	75 ohms
Maximum Optimum Cat-5 Cable Run Component video	1000'
HD 1080p	300'

### **Audio Specifications**

Audio Channels	3 analog
Headroom	10 dB
Signal to Noise	95 dB ref 1 volt
Channel Separation	Greater than 75 dB @ 1 KHz
Balanced Signal Level	3 Vrms max
Input Impedance	20 kohms
Output Impedance	150 ohms

### **General**

#### *Physical dimensions:*

BVD-30	4" H x 5.2" W x 1.3" D
BVR-30	4.5" W x 4.6" W x 1.75" D

#### *Power Supply:*

BVD-30	15 VAC
BVR-30	12 VDC
Cable Connection	RJ-45 EIA-568B Standard
Output trigger voltage	12 volts at 100mA
Warranty	5 Years

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# **AudioControl**<sup>®</sup>

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