

## **ACTIVE-BALANCED SERIES**

### **AudioControl**

*For Those Who Consider Perfection Possible*®

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P/N 913-087-0

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## **ACTIVE-BALANCED SERIES**

# Installation and Operation Manual

## **BVR-25™**

### Wall Mountable Component Video/Digital Audio Receiver

*Thank you* for choosing an AudioControl Active-Balanced product for your video and audio distribution needs. You are installing one of the most innovative custom installation products available. This unit will allow you to receive video and audio signals over standard Category 5 wiring by using the highest 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. Once you cut a hole in the wall, you are committed.

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## Balanced Video Series

Here are some of the cool features of your new BVR-25 balanced video and audio receiver:

- Allows Simple Distribution of Highest-Quality Component Video and Digital Audio Signals up to 1000 feet (305 meters)
- Designed to Work with AudioControl's Balanced Video Transmitters (i.e. BVD-20, BVH-20)
- Receives Signals via Standard Cat-5 Type Cabling
- High Video Bandwidth - Compatible with 480, 720, and 1080 Formats
- Accepts 12 Volt Power via Front Panel Jack or Through Connection on Rear Panel
- Can also Receive Digital Audio or Composite Video Signal
- Signal Sensing 12 Volt Output Trigger
- Standard EIA-568 RJ-45 Cat-5 Connection Jack
- Adjustable Image Compensation and Gain Circuits with Calibration Indicator
- Five Year Warranty and built in the USA



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## BVR-25 Specifications

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

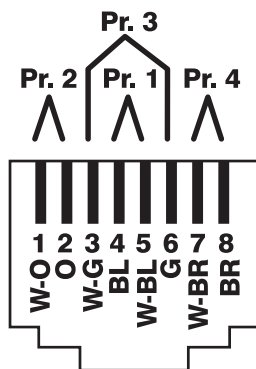
Video Channels	Component
Video Bandwidth	150 MHz @ -3 dB
Component Video Connections	RCA
Video Slew Rate	1500 V/uS
Balanced Video Input Impedance	100 ohms
Video Output Impedance	75 ohms
Audio Channels	1 (digital)
Balanced Digital Audio Input Impedance	100 ohms
Digital Audio Output Impedance	75 ohms
Digital Audio Connector	RCA
Cable Connection	RJ-45 EIA-568B Standard
Optimum Cat-5 Cable Run	
Component video	1000'
HD (1080)	300'
Power supply	12 VDC
Power draw:	130 mA
Output trigger voltage:	12 volts at 100mA
Weight:	1 lb.
Physical dimensions:	4.5"H x 2.75" W x 1.75" D
Installation dimensions:	Standard Single Gang Wall Box
Warranty	5 Years

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

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



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### The First Step In Your Installation Procedure

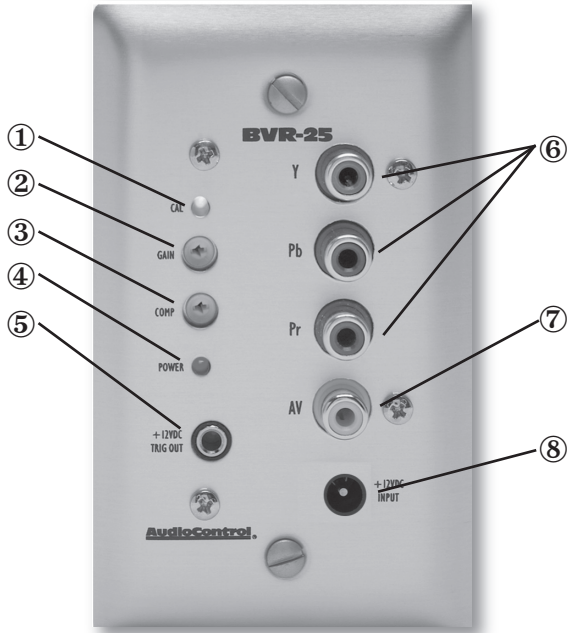
**FILL OUT AND SEND IN THE WARRANTY CARD!**  
Also, save the invoice or sales slip as proof of purchase. These actions will protect this investment and help prove that such a handy piece of audio equipment was really in the system. Insurance companies can have such little imagination when you are trying to make a claim.

### 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.

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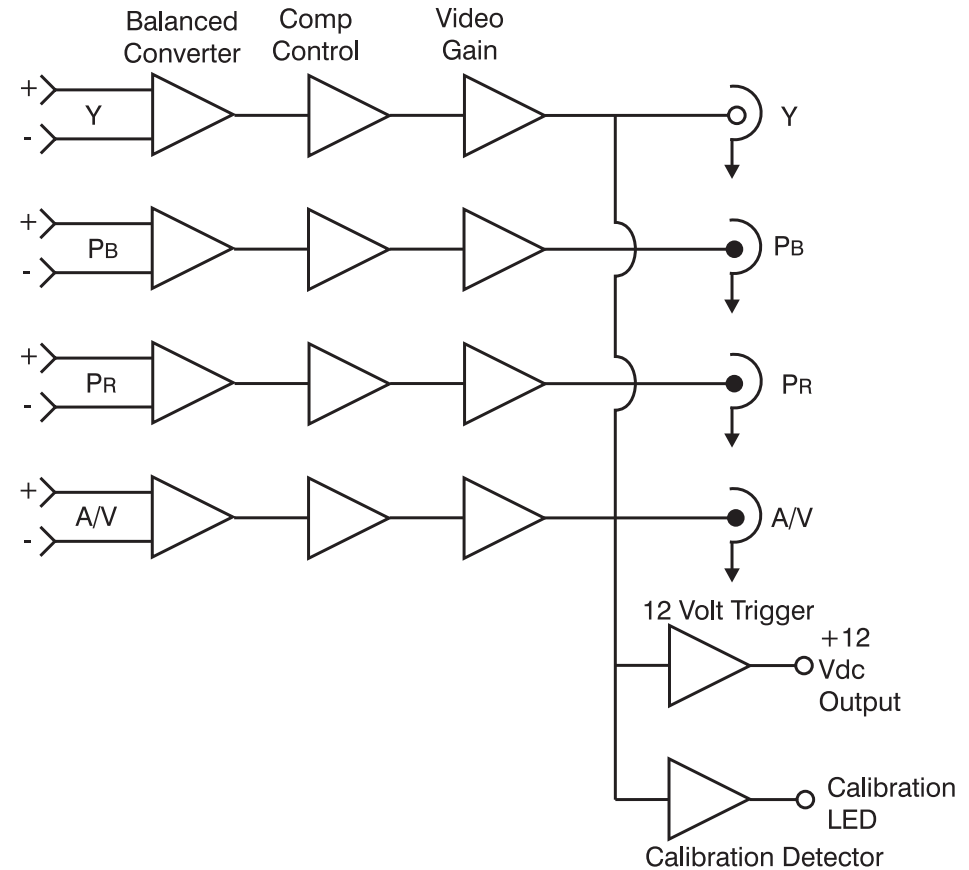
## A Quick Tour of the BVR-25



- ① Video Calibration Indicator Light
- ② Video Signal Gain Control
- ③ Image Compensation Control
- ④ Power Light
- ⑤ 12 volt trigger output
- ⑥ Component Video Outputs
- ⑦ Digital Audio/Composite Video Output
- ⑧ 12 VDC power input

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## Block Diagrams BVR-25



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## Repair Information

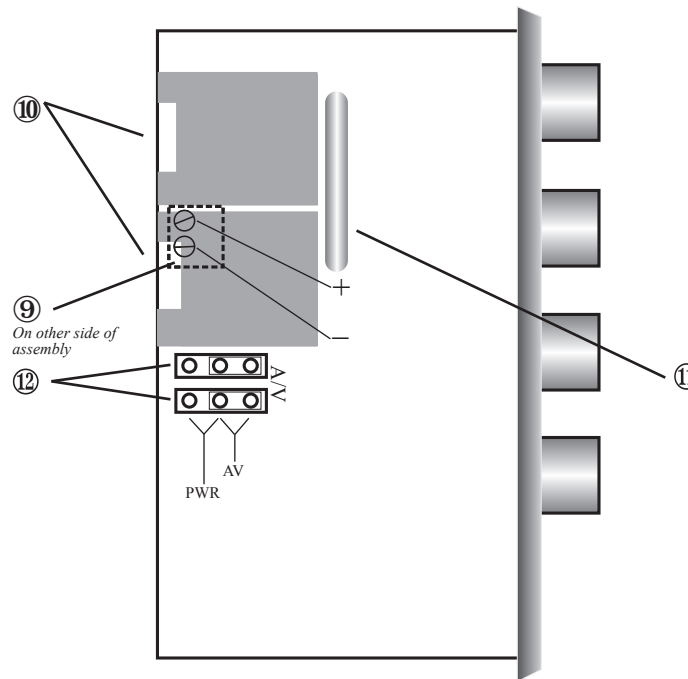
In the unlikely instance that you ever need to have your AudioControl component repaired. Please contact our factory for return instructions. Repairs are handled quickly at our factory. You are responsible for paying the freight charges to our factory. If your unit is under warranty, we'll ship it back 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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Side view of BVR-25

- ⑨ 12 VDC Barrier Block Power Input
- ⑩ RJ-45 inputs/outputs
- ⑪ Termination Resistor Network
- ⑫ RJ-45 Remote Power (4th Pair) Jumpers

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### **Installation Information**

#### **Mounting the BVR-25**

The small size and low power draw of these units allow them to be mounted in almost any dry, indoor location, specifically a single gang J-box (not provided). Pick mounting locations close to the audio or video components that will be connected to the BVR-25. 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 units with a small screwdriver to make any final adjustments

#### **Video Wiring**

The BVR-25 has 4 high-bandwidth outputs that are capable of extending component video signals (3 connectors, Y, P<sub>B</sub>, P<sub>R</sub>) plus a composite video signal on the remaining RCA connector. As an option, you can use the fourth RCA connector on your BVR-25 to transmit a digital audio signal. The following system drawings reflect just a few of the potential systems:

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owner, but you do need a copy of the original sales slip.

4. You cannot let anybody who isn't: (A) the AudioControl factory or (B) somebody authorized in writing by AudioControl to service your BVR-25. If anyone other than (A) or (B) messes with your BVR-25, that voids your warranty.

5. The warranty is also void if the serial number is altered or removed, or if the BVR-25 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 the BVR-25 to level out a bookcase); (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-25 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-25.

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

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

## CONDITIONAL FIVE YEAR WARRANTY

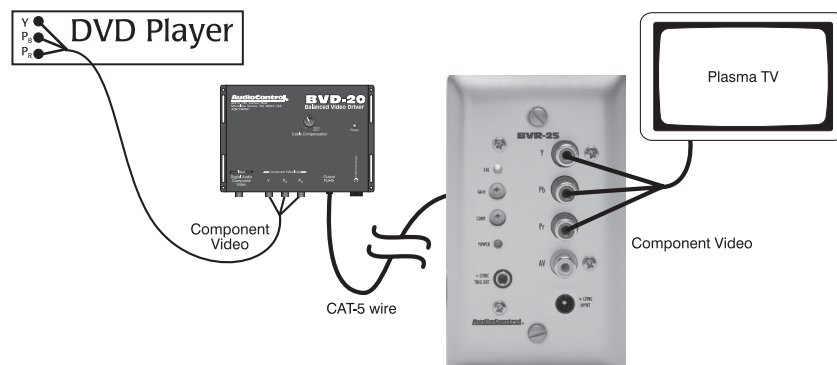
Custom electronics installations are an invisible element of many modern homes. You don't appreciate what they do for you unless something goes wrong. AudioControl recognizes this fact and engineers the most bulletproof components we know how. We stand behind that quality, with a full FIVE YEAR parts 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 the BVR-25 for FIVE YEARS from the date you bought it, and we will fix or replace it, at our option, during that time.

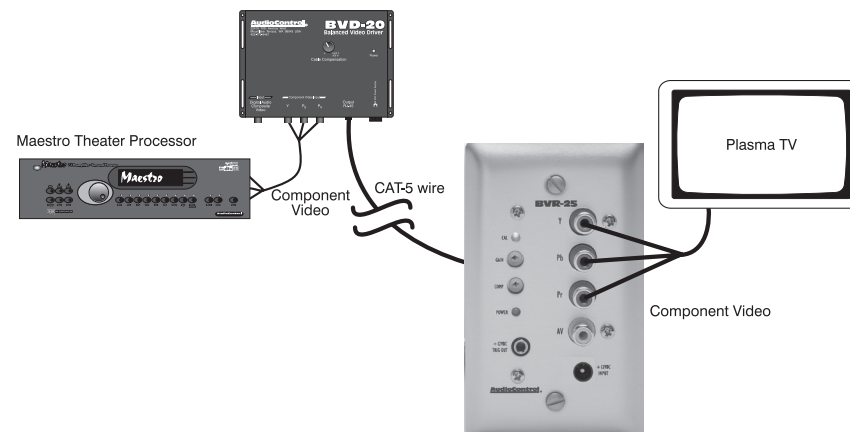
### Here are the conditional conditions:

1. A completed warranty card must be returned to us within 15 days after signing off on the BVR-25 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. The BVR-25 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

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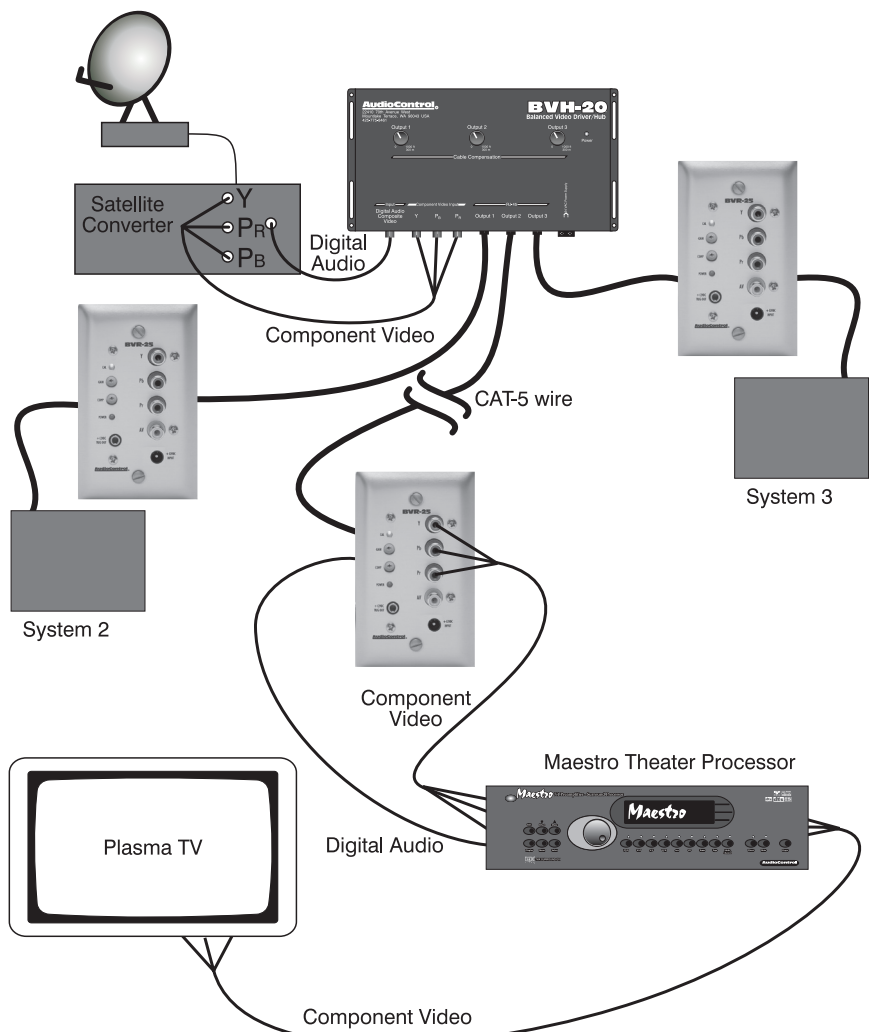


*System 1: Basic system using BVD-20 sending unit and BVR-25 receiver*



*System 2: Theater processor sending component video to video projector/plasma via BVD-20 and a BVR-25*

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System 3: Satellite receiver feeding a BVH-20 and distributed to multiple BVR-25's

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2. Check the Cat-5 wire configurations. Use an RJ-45 cable tester.

### *"Picture is fuzzy or edgy."*

1. Adjust the Cable Compensation control on the BVR-25. This compensates for the increased capacitance on longer Cat-5 cable runs and sharpens the video image.
2. Confirm the cable length. It is important to note that the BVR-25 was designed for cabling no longer than 1000' for standard component video or 300' for a High Definition signal. Cat-6 wiring will give the longest, best picture.

### *"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 output"*

1. Measure output with voltmeter.
2. Confirm amperage required for automation system. Install relay if necessary.
3. The video signal feeding the BVR-25 is too low or uncalibrated. Re-adjust gain and calibration controls.



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## Troubleshooting

### ***“No Picture or Sound.”***

1. Make certain the Power light is on the BVR-25 and the power is on for the sending unit (i.e. BVD-20 or BVH-20).
2. 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.
3. 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.
4. Make certain display or monitor is compatible with format of choice, i.e. 480P; 1080i; etc.

### ***“No Power Light.”***

1. Confirm that you are using the proper 12 VDC for the BVR-25 and that the outlet has power.

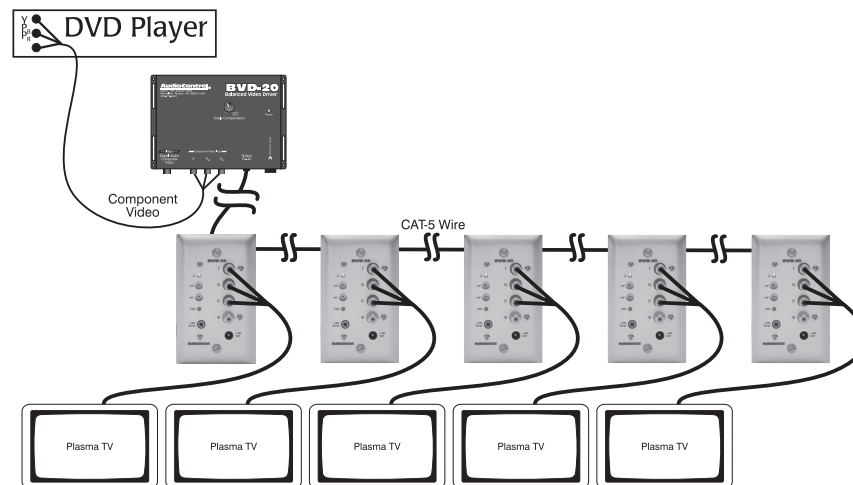
### ***“Horizontal bars across the screen”***

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-25 is not running parallel with any high voltage AC systems.

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

1. Confirm that the “Y”, “P<sub>B</sub>”, and “P<sub>R</sub>” connections are correct.

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System 4: Video signal being fed into BVD-20 and routed to multiple BVR-25's via daisy chain wiring

## Power Wiring

The BVR-25 operates with a 110 VAC to 12 volt DC wall plug transformer (provided) that is terminated with a 5mm 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-25 is different than the 24 volt supply that is used with some other AudioControl balanced line products. Therefore, be careful to not use the wrong power supply. Please note that the striped wire is positive (+) and the solid wire is negative (-).

## Optional Rear Power Connection

As an option you can power the BVR-25 via connection to a barrier block on the rear panel instead of the 5mm jack on the front panel which allows for a cleaner trim-out of

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your installation. When powering the BVR-25 from the rear, it utilizes a 2-pin barrier block, which will require you to cut off the 5mm pin connector from the provided power supply and terminate the wires directly onto the terminals. Please note that the striped wire is positive (+) and the solid wire is negative (-).

### **Remote Powering the BVR-25 via CAT-5**

The BVR-25 can also receive power over the 4th pair of wires in a single CAT-5 cable (Blue and Blue/White) provided you are NOT already sending an audio or video signal over these wires. To use this option you will need to move both Remote Power Jumpers from the “AV” position to the “PWR” position. In addition you will need to provide 12 VDC power over the 4th pair of CAT-5 wires that runs to the BVR-25, which usually requires stripping out the wires from the main loom. If you are providing power from over 100 feet it is recommended that you utilize a larger power supply (15 VDC/500ma) to offset any power loss from the long CAT-5. You can purchase these power supplies from most electrical supply companies. Please note that a switching power supply with a 3-wire AC plug will not work correctly.

### **Grounding**

The BVR-25, 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-25 has high input impedance to

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levels are correct. 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-25 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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## Adjusting the Controls

Properly setting the controls on your BVR-25 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:



**Gain:** Simply, this control on the BVR-25 adjusts the output level or gain on all four of the RCA connections. To help with this adjustment process we have also provided a Calibration Indicator LED that triggers when there is a peak “white” signal level of 1 volt. 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 on that comes with many video test generators. Adjusting the gain control will raise or lower the white levels. The Calibration LED illuminates when the white signal

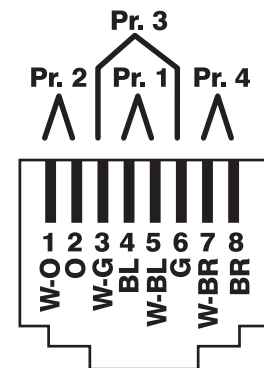
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ground which minimizes the ground loops that can appear in a coax wired system. However it is recommended that you always make sure the structure you are in is wired to the National Electrical Code. The NEC standards require all ground wires to run back to the main panel prior to termination. We now return you to your regularly scheduled manual text...

## Signal Wiring

The BVR-25 operates using standard unshielded twisted-pair (UTP) Category 5 (or better) wiring. Good wiring practices will minimize the chance of noise pickup.

Make certain that you do not run any 110-240 volt power wiring near or parallel to the CAT-5 signal cables as they could radiate noise into the signal wires. You may pick up AC hum. Tests have shown however that you will not pick up songs from the group AC/DC. The BVR-25 uses 12 VDC power, which will not radiate into the signal wires. If you need to cross over a power wire, try to do it at right angles. Keep the signal wiring as far as possible from any noise sources such as lighting power supplies, fluorescent lights, dimmers, actuators, motors, and small children.



RJ-45 connector with wires

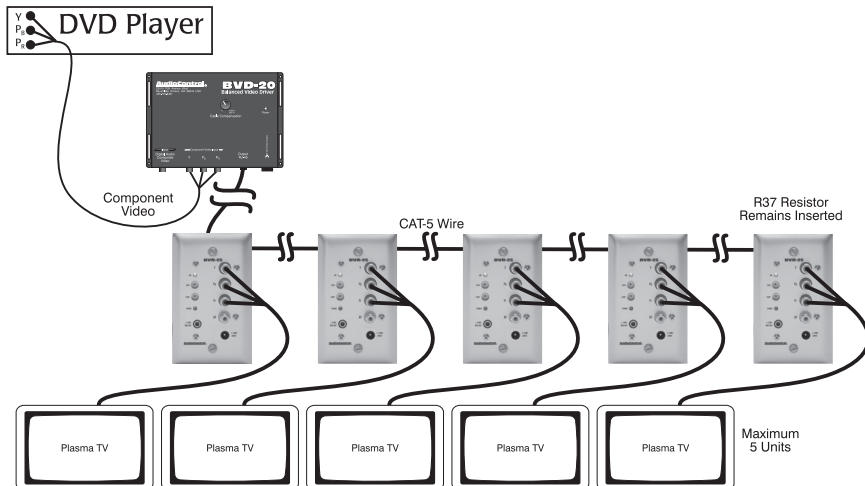
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### Cat-5 Wiring

The RJ-45 connections on the BVR-25 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-20 / BVH-20 to the BVR-25. Do not split or “Y-off” the video signal coming out of your BVD-20 into multiple BVR-25s as the video signal will be compromised. Use the BVH-20 to drive multiple BVR-25s or you can “daisy chain” from one BVR-25 to another if necessary. See page 13 for more information.

### Daisy Chaining Multiple BVR-25's

The BVR-25 has the ability to receive video and audio signals over CAT-5 and then route them on to five maxi-



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mum BVR-25's. This allows for wiring in a daisy chain format rather than the star method. If you are using your BVR-25 in this manner you need to remove the “termination resistor network” from the socket on the rear of the BVR-25 that is routing the signal to another BVR-25. The last BVR-25 in the signal path MUST have the “R37” resistor network inserted for the system to function properly.

### 12 Volt Output Trigger

The BVR-25 is equipped with a unique signal sensing circuit that allows it to 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-25 produces a sustained +12VDC on the tip of the Video Trigger Jack.