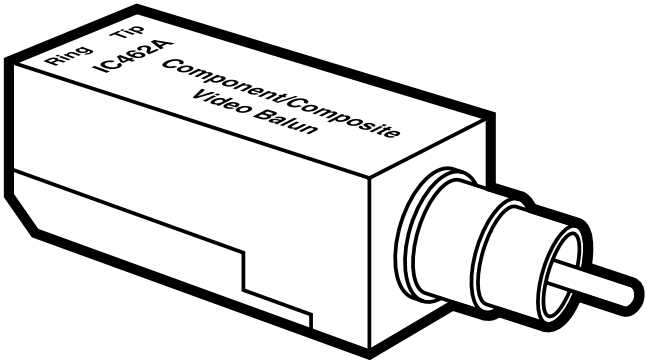
JUNE 2004
IC462A

Component/Composite Video Balun



CUSTOMER SUPPORT INFORMATION

Order **toll-free** in the U.S.: Call **877-877-BBOX** (outside U.S. call **724-746-5500**)
FREE technical support 24 hours a day, 7 days a week: Call **724-746-5500** or fax **724-746-0746**
Mailing address: **Black Box Corporation**, 1000 Park Drive, Lawrence, PA 15055-1018
Web site: **www.blackbox.com** • E-mail: **info@blackbox.com**

FEDERAL COMMUNICATIONS COMMISSION
AND
INDUSTRY CANADA
RADIO FREQUENCY INTERFERENCE STATEMENTS

This equipment generates, uses, and can radiate radio-frequency energy, and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.

TRADEMARKS USED IN THIS MANUAL

Any trademarks mentioned in this manual are acknowledged to be the property of the trademark owners.

Contents

1. Specifications

Video Signals: Component and Composite video

Transmission: Transparent to the user

Bandwidth: Video: DC to 8 MHz

Maximum Input: 1.1 Vp-p

Insertion Loss: Less than 2 dB per balun pair over the frequency range from DC to 8 MHz

Return Loss: Greater than 15 dB over the frequency range from DC to 8 MHz

Common Mode Rejection: Greater than 40 dB @ 8 MHz

Maximum Distance Color (CAT5 UTP): Component ($Y\text{-}P_B\text{-}P_R$): 1000 ft. (304.8 m); Composite: 2200 ft. (670.6 m)

Cable: UTP: 24 gauge or lower solid copper twisted-pair wire impedance: 100 ohms @ 1 MHz;
Maximum capacitance: 20 pF/ft.;
Attenuation: 6.6 dB/1000 ft. @ 1 MHz

Impedance: Input: 75 ohms (RCA connector); Output: 100 ohms balanced UTP (screw terminals)

Connectors (reverse polarity sensitive): (1) RCA male connector, (2) screw terminals for twisted pair

Temperature Tolerance: Operating: 32 to 131°F (0 to 55°C); Storage: -4 to +185°F (-20 to +85°C)

Humidity: Up to 95%, noncondensing

Enclosure: Fire-retardant plastic

Size: 0.5"H x 1.25"W x 0.5"D (1.3 x 3.3 x 1.3 cm)

Weight: 1.5 oz. (42.5 g)

2. Overview

When you're installing video equipment that uses Component or Composite video signals, cabling is a major consideration. If the video devices in your home theater, conference rooms, or training centers are spaced far apart, you can use inexpensive unshielded twisted-pair (UTP) cable to connect them together.

Each Component signal (Y, P_B, and P_R) requires a cable connection. Without the Component/Composite Video Baluns, you'd have to use three coaxial cables for a simple point-to-point Component connection. Instead, use three Component/Composite Video Balun pairs to replace the coaxial cables with one CAT5 twisted-pair cable. *(The Component/Composite Video Baluns must always be used in pairs.)* As a result, you get neater and more streamlined cabling that's also less expensive than coax. For high-resolution Component video, the balun supports CAT5 cable lengths of up to 1000 ft. (304.8 m). The Component/Composite Video Balun is compact enough to allow three units to be connected side-by-side on the back of the Component video equipment.

Composite video requires one cable connection. For a Composite application, the balun supports single-signal (NTSC, PAL, or SECAM) CAT5 connections up to 2200 ft. (670.6 m).

3. Installation

3.1 Component Video (Y-P_B-P_R) Connection

Three video balun pairs (six baluns) are needed to complete one Component (Y-P_B-P_R) connection via CAT5 twisted pair. To install the baluns, follow these steps:

1. Identify the balun's pin configuration (the screw terminal's pins are labeled Tip and Ring). One twisted pair is required. The Component/ Composite Video Balun is reverse polarity sensitive. Make sure that wiring is straight-through (Ring to Ring, Tip to Tip).

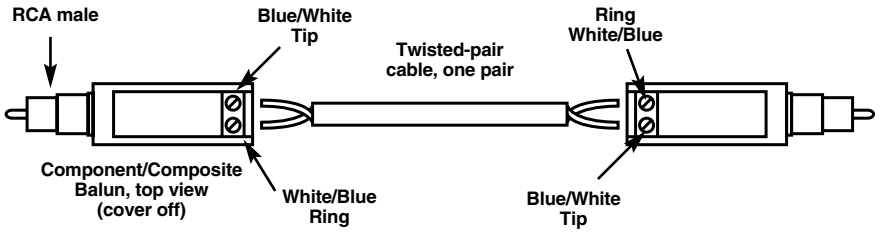


Figure 3-1. The balun's wiring configuration.

2. The Component/Composite Video Baluns work in pairs. For each Component signal (Y, P_B, or P_R), plug one balun into the video source's Component video output (coaxial connector).

3. Plug a second balun into the each of the video monitors' or receivers' Component video inputs (coaxial connectors) at the remote end.

4. Complete the connection between the two baluns using standard twisted-pair cabling. Each balun must be connected to its corresponding Component video balun at the other end. For example, the Component video balun for the "Y" component at the output must be connected to the Component video balun for the "Y" component at the other end.

5. Power on the Component video equipment. Check the image quality and refer to **Chapter 4** if the image quality is unsatisfactory. Figure 3-2 shows a typical installation.

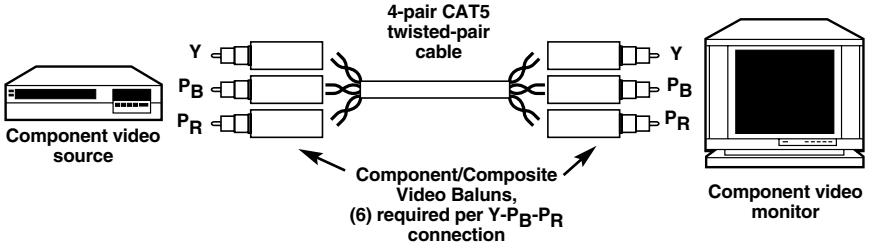


Figure 3-2. Component video connection.

3.2 Composite Video (NTSC, PAL, SECAM) Connection

One balun pair (two baluns) are needed to complete one Composite video connection via CAT5 twisted pair. To install the baluns, perform the same steps as listed in **Section 3.1** by connecting the baluns to the equipment's Composite video input/output connectors. Figure 3-3 shows a typical installation.

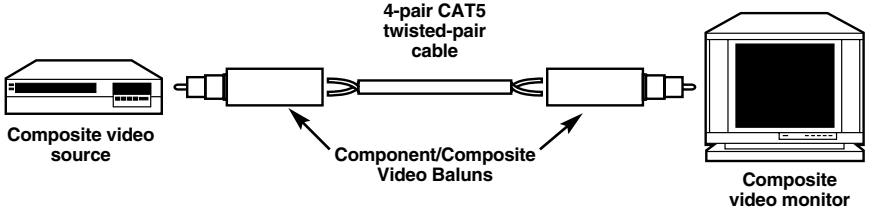


Figure 3-3. Composite video connection.

4. Troubleshooting

4.1 Potential Problems

Symptom: No video.

Probable Causes/Solutions:

1. No continuity in the video link. Verify cable continuity between balun pairs.
2. Power off. Check the video equipment's power supplies.
3. Improper connection, swapped pairs. Check that baluns are connected to the correct video inputs and outputs.

Symptom: Unusual colors.

Probable Causes/Solution: Reversed polarity. Check the wiring and make sure polarity is straight-through.

Symptom: Background pattern.

Probable Causes/Solution: EMI interference. Identify possible radiating frequency sources (wireless LANs, switching power supplies). Try to isolate them from the video connection. Use shielded twisted pair grounded at least on one end.

Symptom: Smearing.

Probable Causes/Solution: Exceeded maximum distance (see **Chapter 1** for distance limits). Verify the cable grade. Use a higher-grade cable, if necessary.

Symptom: Weak contrast.

Probable Causes/Solutions:

1. Exceeded the maximum distance (see **Chapter 1**). Verify the cable grade. Use a higher-grade cable, if necessary. Increase the contrast on the monitor.
2. Unusual link attenuation. Verify the cable distance using an ohmmeter or cable tester.

Symptom: Image is not stable.

Probable Causes/Solution: The link or equipment is defective. Verify the video equipment interface's integrity.

Symptom: Horizontal bars moving slowly.

Probable Causes/Solution: There's substantial crosstalk between multiple video sources. Consecutively turn off other video sources to determine which video source is the cause of interference.

Symptom: Snowy picture.

Probable Causes/Solutions:

1. The maximum distance is near the limit (see **Chapter 1**). Verify the cable grade. Use a higher-grade cable, if necessary.

2. Reduce the color intensity at the monitor.

4.2 Calling Black Box

If you determine that your Component/Composite Video Balun is malfunctioning, do not attempt to alter or repair the unit. It contains no user-serviceable parts. Contact Black Box at 724-746-5500.

Before you do, make a record of the history of the problem. We will be able to provide more efficient and accurate assistance if you have a complete description, including:

- the nature and duration of the problem.
- when the problem occurs.
- the components involved in the problem.
- any particular application that, when used, appears to create the problem or make it worse.

4.3 Shipping and Packaging

If you need to transport or ship your Component/Composite Video Balun:

- Package it carefully. We recommend that you use the original container.
- If you are shipping the balun for repair, make sure you include everything that came in the original package. Before you ship, contact Black Box to get a Return Authorization (RA) number.

Doc. No. 94-000372-A; SE-000379-A

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