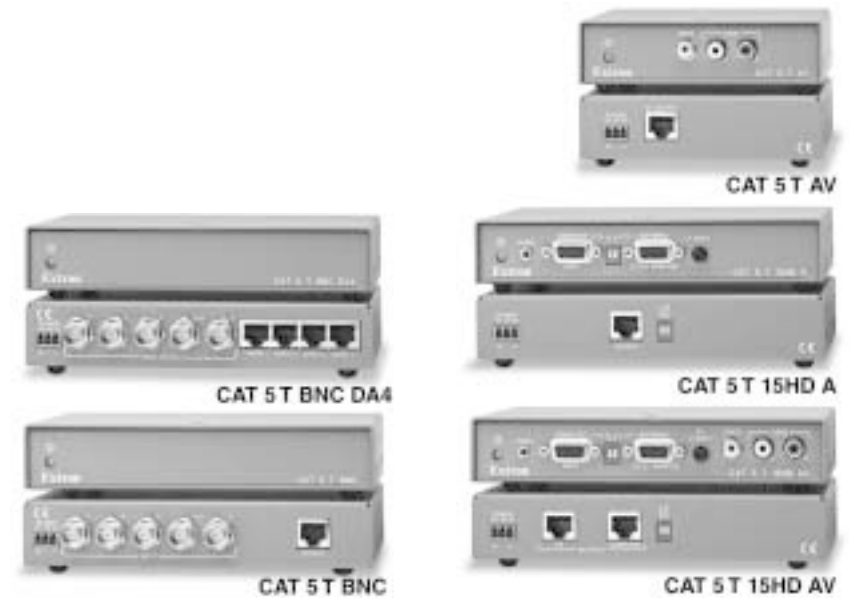


User's Manual

WARNING Do not connect this device to a computer data or telecommunications network



CAT 5 Transmitters Family

High resolution Video, Composite Video, and Stereo Audio
UTP Transmission Products



Extron Electronics, USA
1230 South Lewis Street, Anaheim, CA 92805
800.633.9876 714.491.1500 FAX 714.491.1517
USA

Extron Electronics, Europe
Beeldchemweg 6C, 3821 AH Amersfoort
+31.33.453.4040 FAX +31.33.453.4050
The Netherlands

Extron Electronics, Asia
135 Joo Seng Rd. #04-01, PM Industrial Bldg.
+65.383.4400 FAX +65.383.4664
Singapore 368363

Extron Electronics Information
ExtronWEB™: www.extron.com
ExtronFAX™: 714.491.0192
24-hour access—worldwide!

Precautions

Safety Instructions • English



This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.



This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Consignes de Sécurité • Français



Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).



Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions • Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conservier les instructions • Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Sicherheitsanleitungen • Deutsch



Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.



Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits- und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Instrucciones de seguridad • Español



Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.



Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaución

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean específicamente recomendados por el fabricante, ya que podrían implicar riesgos.

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Avertissement

Alimentations • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité: n'essayez pas de le contourner ni de le désactiver.

Déconnexion de l'alimentation • Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à des opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'il y a remplacement incorrect de la batterie. Remplacer uniquement avec une batterie du même type ou d'un type équivalent recommandé par le constructeur. Mettre au reut les batteries usagées conformément aux instructions du fabricant.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stromversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Litium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puede ser eliminada.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalentamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

FCC Class A Notice

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Note: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance.

Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of two years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:

Extron Electronics
1230 South Lewis Street
Anaheim, CA 92805, USA

Europe, Africa, and the Middle East:

Extron Electronics, Europe
Beeldschermweg 6C
3821 AH Amersfoort
The Netherlands

Asia:

Extron Electronics, Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), or 65.383.4400 (Asia) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

Table of Contents

Chapter 1 • Introduction	1-1
Introduction	1-2
Features	1-2
CAT 5 T 15HD A	1-2
CAT 5 T 15HD AV	1-3
CAT 5 T AV	1-4
CAT 5 T BNC	1-4
CAT 5 T BNC DA4	1-4
Chapter 2 • Installation and Operation	2-1
Installation	2-2
Installation overview	2-2
Jumpers	2-3
Grounding the transmitter	2-4
Input Cabling	2-5
Computer video and PC audio	2-5
Composite video and stereo audio	2-6
RGBHV video	2-7
Transmitted signal cabling	2-8
Termination of CAT 5 cable	2-8
Cable testing	2-8
Equalizing pair skew	2-9
Power connector	2-10
Front Panel Control and Indicator	2-11
Troubleshooting	2-11
If the image does not appear	2-11
If the image is not displayed properly	2-12
If the receiver's Manual/Auto LED flashes	2-12
Appendix • Specifications, Accessories and Part Numbers	A-1
Specifications	A-2
Included Parts	A-4
Accessories	A-6
Cables /Adapters	A-6



Chapter One

Introduction

Introduction

Features

Introduction

Extron's CAT 5 transmitters provide long-distance distribution of RGB video, component video, S-video, composite video, and stereo audio over shielded twisted pair (STP) or unshielded twisted pair (UTP) cable.

The minimum reliable transmission distance is 50 feet. The maximum distance is determined by the output frequency and resolution. The following table specifies the recommended maximum transmission distances using Belden Media Twist 1872A 350 MHz cable or equivalent terminated with Category 6, or at least Category 5e, rated connectors.

NOTE *Extron recommends using the highest quality cable available and affordable. We also recommend the use of pre-terminated and tested cables. Cables terminated on site should be tested before use to ensure that they comply with Category 5e specifications.*

Recommended transmission ranges at 60 Hz

Video format	Maximum range
Composite video and audio	1000 feet
Component video and S-video	1000 feet
640 x 480	1000 feet
800 x 600	800 feet
1024 x 768	600 feet
1280 x 1024	400 feet
1600 x 1280	200 feet

NOTE *It is possible to exceed the recommended distances, however, image quality may be reduced.*

Each transmitted CAT 5 signal must be connected to the appropriate Extron CAT 5 receiver. This user's manual documents the installation, features, and operation of the CAT 5 transmitters only. For information about the CAT 5 receivers, refer to the *CAT 5 Receiver's Family User's Manual*, which accompanies the receivers.

Features

All Extron CAT 5 transmitters provide the following features:

Frequency range — Supports 15 kHz to 130 kHz horizontal frequency.

CAT 5 T 15HD A

Video input — Accepts computer analog video on a 15-pin HD female connector. With an adapter cable, the transmitter can accept Macintosh, 13W3 video, RGBHV, RGBS, RGsB,

component video, S-video, or single source composite video input.

Buffered local monitor output — Allows you to view the displayed image on a local monitor that is located up to 100 feet from the transmitter, without signal reflections or crosstalk.

Audio input — Accepts PC stereo audio on a 3.5 mm mini jack.

RJ-45 connector — Provides a connection to an Extron CAT 5 RGB video receiver.

Horizontal shift — Allows you to adjust the horizontal placement of the image on the screen. Also called "horizontal centering".

Mounting — Can be rack mounted with Extron's CAT 5 Rack Mounting Kit (part #70-123-01) and 1U rack shelf (part #60-190-01), or it can be furniture mounted with Extron's Under Desk Mounting Kit (part #70-077-01) or Through Desk Mounting Kit (part #70-077-02).

CAT 5 T 15HD AV

Video input

Computer video — Accepts computer analog video on a 15-pin HD female connector. With an adapter cable, the 15HD connector can accept a Macintosh video, 13W3 video, or RGBHV, RGBS, RGsB, component video, S-video, or single source composite video input.

Composite video — Accepts composite video on an RCA jack. Alternately, the composite video channel can support digital audio.

Buffered local monitor output — Allows you to view the displayed computer video image on a local monitor that is located up to 100 feet from the transmitter, without signal reflections or crosstalk.

Audio input — Accepts PC audio on a 3.5 mm mini jack, and stereo audio on two RCA jacks.

RJ-45 connectors — One connector provides a connection to an Extron CAT 5 RGB video receiver, and the other provides a connection to a CAT 5 composite video receiver.

Horizontal shift — Allows you to adjust the horizontal placement of the computer video image on the screen.

Mounting — Can be rack mounted with Extron's CAT 5 Rack Mounting Kit (part #70-123-01) and 1U rack shelf (part #60-190-01), or it can be furniture mounted with

Extron's Under Desk Mounting Kit (part #70-077-01) or Through Desk Mounting Kit (part #70-077-02).



CAT 5 T AV

Video input — Accepts composite video on an RCA jack. Alternately, the composite video channel can support digital audio.

Audio input — Accepts stereo audio on two RCA jacks.

RJ-45 connector — Allows connection to an Extron CAT 5 composite video receiver.

Mounting — Can be furniture mounted with Extron's Under Desk Mounting Kit (part #70-077-01) or Through Desk Mounting Kit (part #70-077-02).

CAT 5 T BNC

Video input — Accepts RGBHV, RGBS, RGsB, component video, and composite video on BNC connectors. With an adapter cable, the transmitter can also accept an S-video input.

RJ-45 connector — Allows connection to an Extron CAT 5 RGB video receiver.

Mounting — Can be rack mounted with Extron's CAT 5 Rack Mounting Kit (part #70-123-01) and 1U rack shelf (60-190-01), or it can be furniture mounted with Extron's Under Desk Mounting Kit (part #70-077-01) or Through Desk Mounting Kit (part #70-077-02).

CAT 5 T BNC DA4

Video input — Accepts RGBHV, RGBS, RGsB, component video, and composite video on BNC connectors. With an adapter cable, the transmitter can also accept an S-video input.

RJ-45 connectors — Allows connection to up to four Extron CAT 5 RGB video receivers.

Mounting — Can be rack mounted with Extron's CAT 5 Rack Mounting Kit (part #70-123-01) and 1U rack shelf (part #60-190-01), or it can be furniture mounted with Extron's Under Desk Mounting Kit (part #70-077-01) or Through Desk Mounting Kit (part #70-077-02).

Chapter Two

Installation and Operation

Installation

Front Panel Controls and Indicators

Troubleshooting

Installation overview

To install and set up a CAT 5 transmitter and the associated CAT 5 receiver(s) for operation, perform the following steps:

- 1 Disconnect power from all of the equipment, including the video source(s) (such as computers or DVD players), the transmitter, the receiver, and the output display(s).
- 2 For component, S-video, or composite video, ensure that the internal jumpers are in the correct position (all models except CAT 5 T AV). See *Jumpers* in this chapter.
- 3 Mount the transmitter in a rack, under a desk or podium, or in a desk or table. See the instructions that accompanied the mounting kit for specific information.
- 4 Connect the input cables. See *Input cabling* in this chapter.
- 5 Connect the cable(s) between the transmitter and the CAT 5 receiver(s). See *Transmitted signal cabling* in this chapter and refer to the *CAT 5 Receiver Family User's Manual*, part #68-547-01.
- 6 Configure the CAT 5 receiver(s). Refer to the *CAT 5 Receiver Family User's Manual*, part #68-547-01.
- 7 Connect power cords to the CAT 5 receiver, the CAT 5 transmitter, and turn on the video source(s) and the output display(s).

NOTE All CAT 5 transmitters include a 15V external power supply. The transmitters also receive power from the associated Extron CAT 5 receiver(s) via the CAT 5 cable. Extron recommends using the local power supply; however the power supply may not be necessary in some applications. Use the following guidelines:

- The CAT 5 T 15HD A, CAT 5 T 15HD AV, and CAT 5 T BNC may not require a local power supply for cable lengths of 300 feet or less.
- The CAT 5 T AV may not require a local power supply for cable lengths of 800 feet or less.
- The CAT 5 T BNC DA4 always requires the local power supply.

If problems are encountered, use the local power supply.

- 8 Adjust the picture controls on the front panel of the transmitter and receiver(s). See *Front Panel Control and Indicators* in this chapter and refer to the *CAT 5 Receiver Family User's Manual*, part #68-547-01.

Jumpers

The two RGB video transmitters and the two computer transmitters can be configured to transmit component video, S-video, or composite video.

NOTE The transmitters are factory configured for RGB video. To transmit any other type of video, reconfigure the jumpers.

1. Remove the two screws on each side and the screw on top of the cover (figure 2-1). Lift the cover straight up.

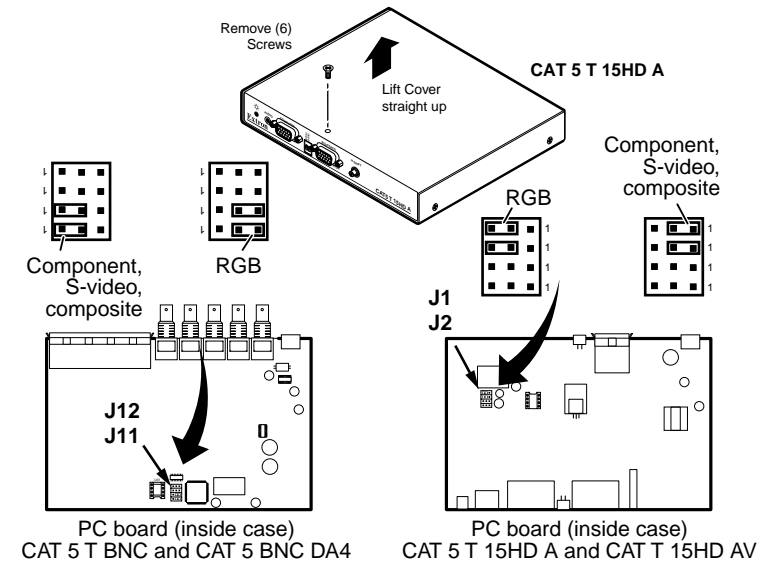


Figure 2-1 — Jumper configuration

2. **CAT 5 T 15HD A and CAT 5 T 15HD AV.** Locate J1 and J2 on the printed circuit board.
 - a. **For RGB video**, ensure that pin 2 is jumpered to pin 3 on both jumper locations.
 - b. **For any other video format**, ensure that pin 1 is jumpered to pin 2 on both jumper locations.

CAT 5 T BNC and CAT 5 T BNC DA4. Locate J11 and J12 on the printed circuit board.

- a. **For RGB video**, ensure that pin 2 is jumpered to pin 3 on both jumper locations.
 - b. **For any other video format**, ensure that pin 1 is jumpered to pin 2 on both jumper locations.
3. Replace the cover and reinstall the screws.

Grounding the transmitter

In certain conditions, RGB and computer video transmitters may need to be grounded to ensure the video and audio are not degraded. Grounding may be required for the CAT 5 T 15HD, CAT 5 T 15HD AV, and CAT 5 T BNC if all of the following conditions are true:

- The signal source is a laptop computer.
- No local monitor is connected.
- A local power supply is not being used.

Grounding may also be required if there is no common ground in the power distribution system.

Indications that grounding may be required include:

- The receiver's Power LED is lit amber when a connection is made to the transmitter.
- The receiver is in auto mode and the receiver's Manual/Auto LED flashes.
- The receiver is in manual mode and an image appears only when the Peaking adjustment is at the minimum level. Additionally, the image may appear overpeaked with horizontal streaking to the right of displayed information.
- No audio, or distorted and noisy audio, is heard.

The transmitter can be grounded using any of the following methods:

- Connect a local 15V power supply to the transmitter.
- Use STP rather than UTP cable and connectors.
- Use a 3.5 mm captive screw connector to connect a ground wire between the return pin on the power connector (figure 2-2) and a grounding point near the transmitter, such as a grounded power outlet or an equipment rack.

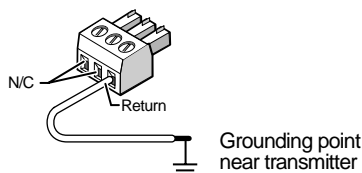


Figure 2-2 — Grounding the transmitter

Input cabling

Computer video and PC audio

The CAT 5 T 15HD AV (figure 2-3) and the CAT 5 T 15HD A (figure 2-4) both accept and transmit computer video and PC audio. These transmitters can also accommodate component video, S-video, or composite video if input on the R, G, and B pins of the 15HD connector using an Extron SY VGA cable, part #26-173-01.

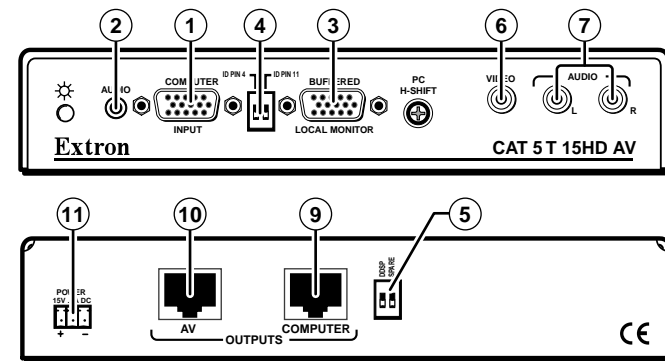


Figure 2-3 — Installation features, CAT 5 T 15HD AV

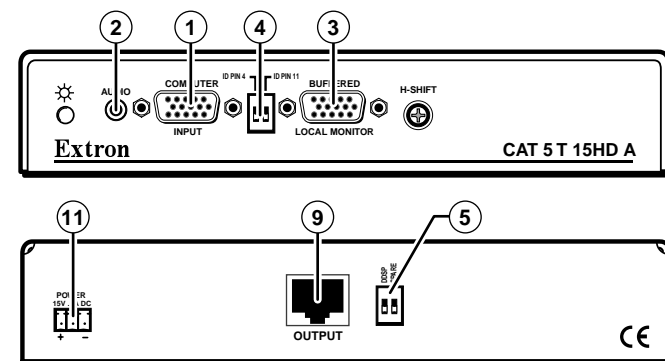


Figure 2-4 — Installation features, CAT 5 T 15HD A

Transmission of component video, S-video, or composite video requires that internal jumpers be reconfigured. See *Jumpers* in this chapter.

- 1 **Computer Input connector** — Connect computer video to this 15HD female connector.

NOTE *Input only sync signals, no video signals, on the sync pins, 13 and 14.*

Installation and Operation, cont'd

For component video, use the R (R-Y) and R return pins (pins 1 and 6), G (Y) and G return pins (pins 2 and 7), and B (B-Y) and B return pins (pins 3 and 8).
For S-video, use the R, R return, B, and B return pins.
For composite video, use the R, G, or B and the associated return pins.

- ② **Audio input connector** — Connect PC audio to this 3.5 mm, stereo jack (tip = L, ring = R, sleeve = ground).

NOTE Input only analog, line level, audio signals on this connector.

- ③ **Buffered Local Monitor output connector** — Connect a local monitor video cable to this 15HD female connector.
- ④ **ID bit termination switches** — If a local monitor is installed, set both switches to off. If no local monitor is installed, set both switches to on.
- ⑤ **DDSP switch** — This switch turns on Digital Display Sync Processing, disabling sync processing for LCD projectors and other displays that cannot tolerate processed sync.

NOTE DDSP disables the horizontal shift control.

Composite video and stereo audio

The CAT 5 T 15HD AV (figure 2-3) and the CAT 5 T AV (figure 2-5) both accept and transmit composite video and stereo audio.

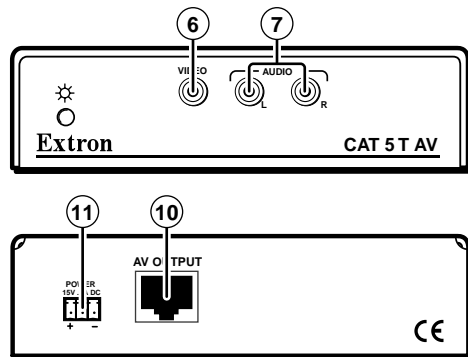


Figure 2-5 — Installation features, CAT 5 T AV

- ⑥ **Video connector** — Connect composite video to this RCA connector. Digital audio can also be connected to this connector.
- ⑦ **Audio input connectors** — Connect left and right stereo audio to these RCA connectors.

NOTE Input only analog, line level, audio signals on these connectors.

RGBHV video

The CAT 5 T BNC (figure 2-6) and the CAT 5 T BNC DA4 (figure 2-7) both accept and transmit RGBHV, RGBS, RGsB, component video, S-video, and composite video.

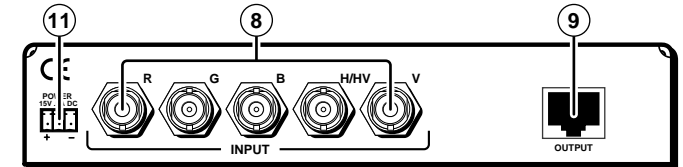


Figure 2-6 — Installation features, CAT 5 T BNC

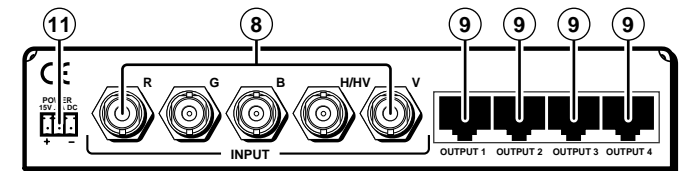


Figure 2-7 — Installation features, CAT 5 T BNC DA4

- ⑧ **Video connector** — Connect the desired video input device to the rear panel input BNCs. Transmission of component video, S-video, or composite video requires that internal jumpers be reconfigured. See *Jumpers* in this chapter.

NOTE Input only sync signals, no video signals, on the H/V and V BNCs.

For RGBHV video, use the R, G, B, H/HV, and V BNCs.



For RGBS video, use the R, G, B, and H/HV BNCs.



For component video, use the R (R-Y), G (Y), and B (B-Y) BNCs.



For S-video, use the R and B BNCs.



For composite video, use the R, G, and/or B BNC.



Transmitted signal cabling

WARNING Do not connect this device to a computer data or telecommunications network

NOTE RJ-45 termination must comply with the TIA/EIA T 568A wiring standards for all connections.

- 9 **RGB video transmission connector** — Attach one end of a CAT 5 UTP cable to this RJ-45 female connector. Attach the other end to an Extron CAT 5 BNC receiver.
- 10 **Composite video transmission connector** — Attach one end of a CAT 5 UTP cable to this RJ-45 female connector. Attach the other end to an Extron CAT 5 composite video receiver.

Termination of CAT 5 cable

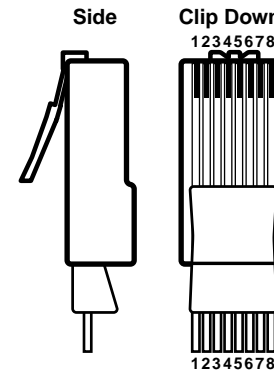
Figure 2-8 details the recommended termination of CAT 5 cables in accordance with the TIA/EIA T 568A wiring standards.

Cable testing

To ensure proper cable termination, each transmission cable system should be tested. Testing the cable from the RJ-45 connections at the transmitter and receiver gives the most accurate indications of cable problems.

There are two varieties of cable runs: simple runs, in which a single cable is terminated only at the transmitter and receiver, and complex runs, which can include patch bays and multiple terminations and lengths of cable. In either case, the entire cabling system should be tested.

A complete test measures cable length and tests the wire map, attenuation, NEXT, PSNEXT, ELFEXT, PSELFEXT, return loss, ACR and PSARC. All of these tests are critical for digital data transfer. While all of these tests are important indicators of the quality of the cable termination, the most critical testing parameters for video transfer are wire map (T-568-A termination) and pair length measurements. The largest concern is equalization of skew between cable pairs. Cable systems of 300 feet or less should exhibit no transmission problems if they pass at least CAT 5e or preferably CAT 6-D5 channel certification testing.



Pin	Wire color	RGB video and audio		AV Video and audio	
		Signal	Level	Signal	Level
1	White-green	Red/V. sync+	±0.35V	Video+	+0.35V
2	Green	Red/V. sync-	±0.35V	Video-	-0.35V
3	White-orange	Audio & power	+15V with ±0.5 V	Power+	+15V
4	Blue	Green+	+0.35V	Reserved	None
5	White-blue	Green-	-0.35V	Reserved	None
6	Orange	Audio & power	±0.5 V	Power-	0V
7	White-brown	Blue/H. sync+	±0.35V	Audio+	±0.5 V
8	Brown	Blue/H. sync-	±0.35V	Audio-	±0.5 V

Figure 2-8 — CAT 5 cable termination

The Microtest OMNI SCANNER 2 performs comprehensive certification testing to the proposed CAT 6 standards. Other manufacturers also make testing equipment. The tests include advanced diagnostics for troubleshooting the cause and location of many cable and termination problems. For simple installation testing, the Microtest MICRO SCANNER PRO tests wire map and cable length, including individual cable pair length.

Equalizing pair skew

The manufacturing process for UTP cable leads to a condition called pair skew. Skew exists between pairs when the physical length of one wire pair is different from another. As the transmission cable length increases, the amount of skew increases. Skew affects the displayed image when the differential length between wire pairs exceeds 2 feet, causing the timing of the red, green, and blue video signals to appear out of alignment (horizontal registration errors). A white vertical line on a black field can appear as individual red, green, and blue lines that are close together; the signal transmitted on the shortest wire pair leads the other colors and appears to the left on the display.

UTP cable test equipment measures and reports wire pair length. The report on the various pair lengths can be used in equalizing pair skew. The nominal velocity of propagation (NVP — the speed at which the signal travels on the transmission line, measured as a percentage of the speed of light) is very close to that of conventional coaxial cable. The similarity in NVP means that an additional length of coax equal to the length of pair skew, placed on the receiver's output, equalizes the effects of pair skew (figure 2-9).

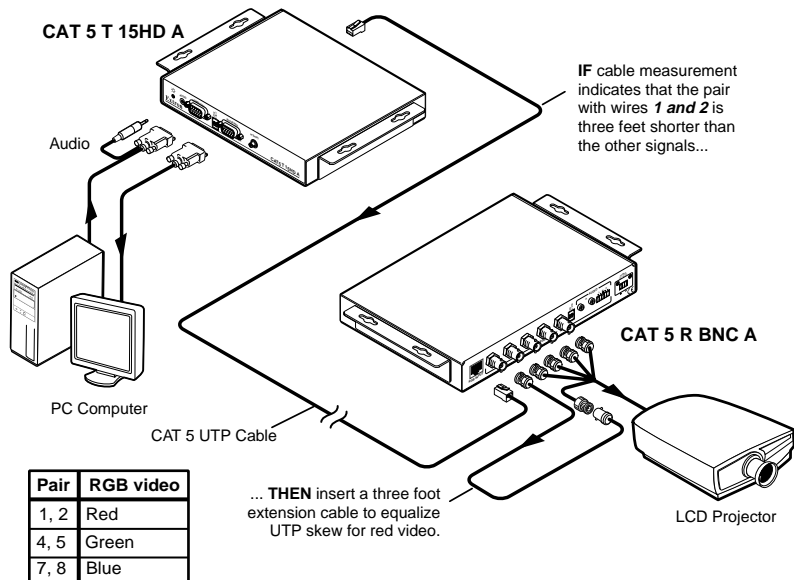


Figure 2-9 — Pair skew equalization

If UTP cable test measurement cannot be done, pair skew can still be equalized by viewing a test pattern with a critical eye. Examine the test pattern for loss of horizontal registration and, through a process of trial and error, equalize any pair skew with coax extensions on the red, green, and/or blue outputs.

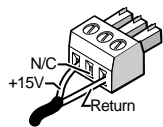
Power connector

⑪ Power

CAT 5 T BNC DA4 — Plug the external 15V power supply into this captive screw connector.

NOTE *If the remote power distance is too great to power the transmitter, the video image is missing, distorted, or noisy, or the receiver's Manual/Auto LED flashes. The transmitter requires a local 15V power supply.*

CAT 5 T 15HD A, CAT 5 T 15 HD AV, and CAT 5 T BNC — If desired or for distances over 300', plug an external 15V power supply into this captive screw connector. Follow the wiring guide at left for polarity.



CAT 5 T AV — If desired or for distances over 800', plug an external 15V power supply into this captive screw connector.

Front Panel Control and Indicator

All of the CAT 5 transmitters have Power indicators. In addition, the CAT 5 T 15HD A and CAT 5 T 15HD AV (figure 2-10) have horizontal shift control.

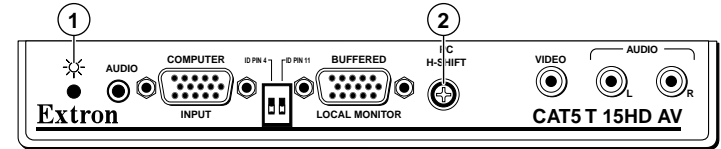


Figure 2-10 — Control and indicators

① Power indicator

Amber — indicates that power is applied, but that the transmitter is not connected to a receiver.

Green — indicates that the transmitter is connected to a receiver.

② H. Shift control (CAT 5 T 15HD A and CAT 5 T 15HD AV) — This front panel knob adjusts the side-to-side image placement.

NOTE *For details on the ID bit and DDSP switches, see Computer video and PC audio in this chapter.*

Troubleshooting

If the image does not appear

1. Ensure that all devices are receiving power. The transmitter's and receiver's front panel Power LEDs indicate that they are receiving power.
2. Ensure that the transmitter is receiving a video input.
3. Ensure that the CAT 5 cable(s) are properly terminated in accordance with TIA/EIA T 568A standards and that the RJ-45 connections are securely made. If the Power LEDs on the transmitter and the receiver are lit green, a transmitter is properly connected to a receiver.
4. For computer/RGB video, ensure that the receiver's SOG and C Sync switches are in the correct positions for the video output.
5. For computer video, ensure that the transmitter's ID bit switches are on.
6. For computer video on an LCD projector, ensure that the transmitter's DDSP switch is on.

7. The transmission distance may be too far for remote power. Try connecting the local 15V power supply to the transmitter.
8. The transmission distance may be too short. Ensure that the UTP cable is at least 50 feet long.
9. If the Manual/Auto switch is in the manual position, ensure that the receiver's level controls are not set too high. Too much level and peaking can cause display problems.
10. For computer video from a laptop or for ungrounded AC distribution systems, the transmitter may need to be grounded. See *Grounding the transmitter* earlier in this chapter.
11. Call the Extron S³ Sales & Technical Support Hotline if necessary.

If the image is not displayed correctly

1. For computer/RGB video, if the output image looks too green, ensure that the receiver's SOG switch is off.
2. For computer video, if the picture hangs off the edge of the screen, adjust the transmitter's H Shift control.

NOTE *DDSP disables the horizontal shift control.*

3. Place the receiver's Manual/Auto switch to manual and adjust the level and peaking controls for optimum quality.
4. The transmission distance may be too far for remote power. Try connecting the local 15V power supply to the transmitter.
5. For computer video from a laptop or for ungrounded AC distribution systems, the transmitter may need to be grounded. See *Grounding the transmitter* earlier in this chapter.
6. If the image still does not display properly, call the Extron S³ Sales & Technical Support Hotline.

If the receiver's Manual/Auto LED flashes

1. The transmission distance may be too far for remote power. Connect the local 15V power supply to the transmitter.
2. Check the RJ-45 connector for a loose connection.



CAT 5 Transmitters



Specifications

Accessories and Part Numbers

Specifications

Included Parts

Accessories

Cables/Adapters

Specifications, Accessories, and Part Numbers

Video

Number/signal type	1, 2, or 4 sets of proprietary analog signals
Connectors	1, 2, or 4 RJ-45 female

Video input

Number/signal type	
CAT 5 T 15HD A	1 analog RGBHV, RGBS, RGsB, component video, or S-video; or 1 S-video and 1 NTSC/PAL/SECAM composite video from a single source; or 3 NTSC/PAL composite video from a single source
CAT 5 T 15HD AV	1 analog RGBHV, RGBS, RGsB, component video, or S-video; or 1 S-video and 1 NTSC/PAL/SECAM composite video from a single source; or 3 NTSC/PAL/SECAM composite video from a single source <i>and 1 NTSC/PAL/SECAM composite video</i>
CAT 5 T BNC	
CAT 5 T BNC DA4,	1 analog RGBHV, RGBS, RGsB, component video, or S-video; or 1 S-video and 1 NTSC/PAL/SECAM composite video from a single source; or 3 NTSC/PAL/SECAM composite video from a single source
CAT 5 T AV	1 NTSC/PAL/SECAM composite video
Connectors	
CAT 5 T 15HD A	1 15-pin HD female (Mac and Sun/SGI to VGA adapters are available)
CAT 5 T 15HD AV	1 15-pin HD female (Mac and Sun/SGI to VGA adapters are available), 1 RCA female
CAT 5 T BNC,	5 BNC female
CAT 5 T BNC DA4	
CAT 5 T AV	1 RCA female
Minimum/maximum level(s)	0.3V to 1.45V p-p with no offset at unity gain
Impedance	75 ohms
Horizontal frequency	15 kHz to 130 kHz
Vertical frequency	30 Hz to 150 Hz

Video output — refer to the CAT 5 Receivers Family User's Manual, part #68-547-01

Audio

Number/signal type	1, 2, or 4 sets of analog proprietary signals
Connectors	1, 2, or 4 RJ-45 female
Frequency response	20 Hz to 20 kHz, ± 0.05 dB
THD + noise	0.03% @ 1 kHz, 0.3% @ 20 kHz at rated maximum output drive (+19.5dBu input, +21dBu output)
S/N	>90dB at output +21dBu
Crosstalk	>80dB @ 1 kHz, fully loaded
Stereo channel separation	>80dB @ 1 kHz
CMRR	>75dB @ 20 Hz to 20 kHz

Audio input

Number/signal type	
CAT 5 T 15HD A,	
CAT 5 T AV	1 stereo, unbalanced
CAT 5 T 15HD AV	2 stereo, unbalanced
Connectors	
CAT 5 T 15HD A	1 3.5 mm mini jack
CAT 5 T 15HD AV	1 3.5 mm mini jack, 2 female RCA
CAT 5 T AV	2 female RCA
Impedance	10 kohms, unbalanced, DC coupled
Minimum level	100 mV
Maximum input level	+8.5dBu (balanced/unbalanced) @ stated %THD+N
CMRR	>75dB @ 20 Hz to 20 kHz

Audio output — refer to the CAT 5 Receivers Family User's Manual, part #68-547-01

General

Power	
CAT 5 T 15HD A,	
CAT 5 T 15HD AV,	
CAT 5 TBNC	15VDC, 0.8A, external or provided by the CAT 5 receiver for up to 300' distance
CAT 5 T AV	15VDC, 0.8A, external or provided by the CAT 5 receiver for up to 800' distance
CAT 5 T BNC DA4	15VDC, 0.8A, external

Specifications, Accessories, and Part Numbers cont'd

Temperature/humidity	Storage -40° to +158°F (-40° to +70°C) / 10% to 90%, non-condensing Operating +32° to +122°F (0° to +50°C) / 10% to 90%, non-condensing
Rack mount	
CAT 5 T 15HD A, CAT 5 T 15HD AV, CAT 5 T BNC, CAT 5 T BNC DA4	Yes, with optional 1U rack shelf, part #60-190-01. Also rack shelf mounting kit #70-123-01, and furniture mountable with optional mounting brackets #70-077-01 or #70-077-02
CAT 5 T AV	No, but furniture mountable with optional mounting brackets #70-077-01, 70-077-02
Enclosure type	Metal
Enclosure dimensions	
CAT 5 T 15HD A, CAT 5 T 15HD AV, CAT 5 T BNC, CAT 5 T BNC DA4	1.25" H x 7.0" W x 4.5" D 3.18 cm H x 17.78 cm W x 11.43 cm D (Depth excludes connectors.)
CAT 5 T AV	1.25" H x 4.75" W x 4.5" D 3.18 cm H x 12.07 cm W x 11.43 cm D (Depth excludes connectors.)
Shipping weight	3 lbs (1.4 kg)
Vibration	ISTA/NSTA 1A in carton (International Safe Transit Association)
Approvals	UL, CUL, CE, FCC Class A
MTBF	30,000 hours
Warranty	2 years parts and labor

NOTE Specifications are subject to change without notice.

Included Parts

These items are included in each order for a specific CAT 5 transmitter:

Included parts	Part number
CAT 5 T AV	60-348-01
CAT 5 Transmitters User's Guide	68-546-01
CAT 5 T AV label	33-603-01
External power supply, 15V, 0.8A	70-057-01
Captive screw connector, 3 pole, 3.5 mm	10-265-03
CAT 5 T 15HD A	60-345-01
CAT 5 Transmitters User's Guide	68-546-01
CAT 5 T 15HD label	33-603-03
External power supply, 15V, 0.8A	70-057-01
Captive screw connector, 3 pole, 3.5 mm	10-265-03
CAT 5 T 15HD AV	60-346-01
CAT 5 Transmitters User's Guide	68-546-01
CAT 5 T 15HD label	33-603-03
External power supply, 15V, 0.8A	70-057-01
Captive screw connector, 3 pole, 3.5 mm	10-265-03
CAT 5 T BNC	60-345-01
CAT 5 Transmitters User's Guide	68-546-01
CAT 5 T BNC label	33-603-02
External power supply, 15V, 0.8A	70-057-01
Captive screw connector, 3 pole, 3.5 mm	10-265-03
CAT 5 T BNC DA4	60-345-01
CAT 5 Transmitters User's Guide	68-546-01
CAT 5 T BNC label	33-603-02
External power supply, 15V, 0.8A	70-057-01
Captive screw connector, 3 pole, 3.5 mm	10-265-03

Specifications, Accessories, and Part Numbers cont'd

Accessories

Accessories	Part number
External power supply, 15V, 0.8A	70-057-01
Extron 19" 1U Universal Rack Shelf	60-190-01
Extron CAT 5 Rack Mounting Kit	70-123-01
Extron Under Desk Mounting Kit	70-077-01
Extron Thru-desk Mounting Kit	70-077-02

Cables/Adapters

Cable/adaptor	Part number
VGHM 6' MHRA 15HD cable with audio	26-490-02
VGHM 3' MHRA 15HD cable with audio	26-490-01
VGHM 12' MHRA 15HD cable with audio	26-490-03
Extron SY VGA cable	26-173-01
BNC-5-25'MHR (25 feet/7.6 meters)	26-260-03
BNC-4-25'MHR (25 feet/7.6 meters)	26-210-04
SVHS 6' (6 feet/1.8 meters)	26-316-02
SVHSM - BNCF	26-353-01
SVHSM - BNCFM-3'	26-353-03