Dolby

Cat. No. 701
Digital Soundhead

Installation Instructions

Issue 4 Part No. 91478

NOTE: For complete system installation and Cat. No. 701 alignment, please refer to the appropriate Dolby processor manual.

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Chapter 1
Power Requirements

1.1 Power Requirements

The Cat. No. 701 Digital Soundhead contains an internal power supply and is intended for operation at nominal 120 VAC or 240 VAC input. The switching power supply used in the Cat. No. 701 may be used with mains voltages in the range 85-265 VAC, 50-60 Hz without adjustment for input voltage.

FUSE—T 400 mA 5 mm x 20 mm Time Lag

The fuse may be inspected or replaced by removing the power cord from the unit and opening the hinged cover of the power entry module. The fuse holder can then be removed.

1.2 Regulatory Notices

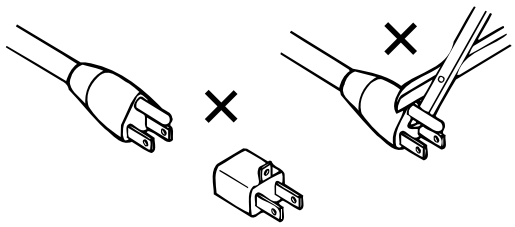
FCC

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 this 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 or her own expense.

UL

CAUTION: Installation and troubleshooting must be performed by trained technicians. Do not attempt to install or service the unit unless you are qualified to do so. A power cord for connecting to 120 VAC mains is supplied with units shipped to U.S. destinations.

WARNING: Check that the correct fuse has been installed. To reduce the risk of fire, replace the fuse only with one of the same type and rating. Do not use a ground-lifting adapter and never cut the ground pin on the three-prong power plug.



U.K.
Connections for United Kingdom.

WARNING: THIS APPARATUS MUST BE EARTHED.

As the colours of the cores in the mains lead may not correspond with the coloured markings identifying the terminals in your plug, proceed as follows:

- The core which is coloured green and yellow must be connected to the terminal in the plug which is marked with the letter **E** or by the earth symbol ⏚, or coloured green or green and yellow.
- The core which is coloured blue must be connected to the terminal which is marked with the letter **N** or coloured black.
- The core which is coloured brown must be connected to the terminal which is marked with the letter **L** or coloured red.

IEC NOTICES

LED Light DO NOT STARE INTO BEAM CLASS 2 LED Product Per EN 60825-1:1996 1mW at 650-680 nm	GB
Faisceau de LED Ne pas rester dans le faisceau LED Classe 2 selon EN 60825-1:1996 1 mW à 650-680 nm	F
LED Lichtquelle Nicht in den Lichtstrahl blicken LED der Kategorie 2 entspr . EN 60825-1:1996 1 mW bei 650-680 nm	D
L'indicatore del LED Non guardare fissamente il raggio Prodotto LED classe 2 secondo al EN 60825-1: 1996 1 mW a 650-680 nm	I
La luz LED No mire fijamente al rayo de luz Producto LED clase 2 según el estandár EN 60825-1: 1996 1 mW a 650-680 nm	E
LED ljus Undvik att titta direkt in i laser strålen Klass 2 LED produkt per EN 60825-1:1996 1 mW wid 650-680 nm	S
LED belichting Kijk niet in de lichtstraal Klasse 2 LED product volgens EN60825-1:1996 1 mW bij 650-680 nm	NL

IMPORTANT SAFETY NOTICE

GB

This unit complies with the safety standard IEC65. To ensure safe operation and to guard against potential shock hazard or risk of fire, the following **must** be observed:

- If the unit has a **voltage selector**, ensure that it is set to the correct mains voltage for your **supply**. If there is no voltage selector, ensure that your supply is in the correct range for the input requirement of the unit.
- Ensure **fuses** fitted are the **correct rating and type** as marked on the unit.
- The unit **must be earthed** by connecting to a correctly wired and **earthed** power outlet.
- The **power cord** supplied with this unit must be wired as follows:

Live—Brown Neutral—Blue Earth—Green / Yellow

IMPORTANT – NOTE DE SECURITE

F

Ce materiel est conforme à la norme IEC65. Pour vous assurer d'un fonctionnement sans danger et de prévenir tout choc électrique ou tout risque d'incendie, veillez à observer les recommandations suivantes.

- Le selecteur de tension doit être placé sur la valeur correspondante à votre alimentation réseau.
- Les fusibles doivent correspondre à la valeur indiquée sur le materiel.
- Le materiel doit être correctement relié à la terre.
- Le cordon secteur livré avec le materiel doit être cablé de la manière suivante:

Phase—Brun Neutre—Bleu Terre—Vert / Jaune

WICHTIGER SICHERHEITSHINWEIS

D

Dieses Gerät entspricht der Sicherheitsnorm IEC65. Für das sichere Funktionieren des Gerätes und zur Unfallverhütung (elektrischer Schlag, Feuer) sind die folgenden Regeln unbedingt einzuhalten:

- Der Spannungswähler muß auf Ihre Netzspannung eingestellt sein.
- Die Sicherungen müssen in Type und Stromwert mit den Angaben auf dem Gerät übereinstimmen.
- Die Erdung des Gerätes muß über eine geerdete Steckdose gewährleistet sein.
- Das mitgelieferte Netzkabel muß wie folgt verdrahtet werden:

Phase—braun Nulleiter—blau Erde—grün / gelb

NORME DI SICUREZZA – IMPORTANTE

I

Questa apparecchiatura è stata costruita in accordo alle norme di sicurezza IEC 65. Per una perfetta sicurezza ed al fine di evitare eventuali rischi di scossa êlettrica o d'incendio vanno osservate le seguenti misure di sicurezza:

- Assicurarsi che il selettore di cambio tensione sia posizionato sul valore corretto.
- Assicurarsi che la portata ed il tipo di fusibili siano quelli prescritti dalla casa costruttrice.
- L'apparecchiatura deve avere un collegamento di messa a terra ben eseguito; anche la connessione rete deve avere un collegamento a terra.
- Il cavo di alimentazione a corredo dell'apparecchiatura deve essere collegato come segue:

Filo tensione—Marrone Neutro—Blu Massa—Verde / Giallo

AVISO IMPORTANTE DE SEGURIDAD

E

Esta unidad cumple con la norma de seguridad IEC65. Para asegurarse un funcionamiento seguro y prevenir cualquier posible peligro de descarga o riesgo de incendio, se han de observar las siguientes precauciones:

- Asegúrese que el selector de tensión esté ajustado a la tensión correcta para su alimentación.
- Asegúrese que los fusibles colocados son del tipo y valor correctos, tal como se marca en la unidad.
- La unidad debe ser puesta a tierra, conectándola a un conector de red correctamente cableado y puesto a tierra.
- El cable de red suministrado con esta unidad, debe ser cableado como sigue:

Vivo—Marrón Neutro—Azul Tierra—Verde / Amarillo

VIKTIGA SÄKERHETSÅTGÄRDER!

S

Denna enhet uppfyller säkerhetsstandard IEC65. För att garantera säkerheten och gardera mot eventuell elchock eller brandrisk, måste följande observeras:

- Kontrollera att spänningsväljaren är inställd på korrekt nätspänning.
- Konrollera att säkringarna är av rätt typ och för rätt strömstyrka så som anvisningarna på enheten föreskriver
- Enheten måste vara jordad genom anslutning till ett korrekt kopplat och jordat el-uttag.
- El-sladden som medföljer denna enhet måste kopplas enligt foljande:

Fas—Brun Neutral—Blå Jord—Grön / Gul

BELANGRIJK VEILIGHEIDS-VOORSCHRIFT:

NL

Deze unit voldoet aan de IEC65 veiligheids-standaards. Voor een veilig gebruik en om het gevaar van electrische schokken en het risico van brand te vermijden, dienen de volgende regels in acht te worden genomen:

- Controleer of de spanningscaroussel op het juiste Voltage staat.
- Gebruik alleen zekeringen van de aangegeven typen en waarden.
- Aansluiting van de unit alleen aan een geaarde wandcontactdoos.
- De netkabel die met de unit wordt geleverd, moet als volgt worden aangesloten:

Fase—Bruin Nul—Blauw Aarde—Groen / Geel

Chapter 2
Initial Setup and Installation

2.1 Mounting the Digital Soundhead

Adapter Plates

The Cat. No. 701 Digital Soundhead casting has bolt patterns for several common projector types, and may be mounted to the following projectors without an adapter plate:

Ballantyne Pro 35
Century SA and JJ (Note: early versions may require an adapter)
Christie P35
Cinemeccanica V5, V8 , and V9.

Note: A Cat. No. 690 Adapter is required for re-installing the Cinemeccanica V8 upper reel arm to the top of the Cat. No. 701 Digital Soundhead.

Simplex 35 and 35/70

Adapter mounting plates are available for the following projectors:

Norelco AA-II / Philips DP70	Cat. No. 695
Kinoton DP75, FP20, FP30	Cat. No. 696

Additional adapter plates may become available. Contact Dolby Laboratories or your dealer for availability.

Accessories

Roller assemblies (35 mm and a combination 35 mm/70 mm) are available for threading film along a bypass path.

A replacement LED/heatsink assembly, Part Number 83308, is available for field installation. See Chapter 3 of this manual for installation details.

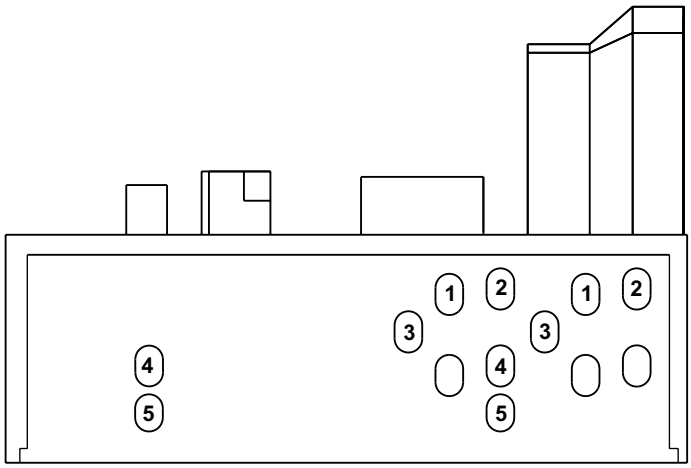
Installation

While the Digital Soundhead is rugged and reliable, it has been designed and built to precision optical and mechanical tolerances. Handle the unit very carefully.

1. Remove the package of parts from the top of the shipping box.

2. Pull out the plastic bag containing the Digital Soundhead, and slide it out of the surrounding foam. Place the digital soundhead on a table or bench top,

with mounting base down. (The mounting base is the surface with thirteen mounting holes.) **Figure 2.1** shows how the mounting holes correspond to bolt patterns for various projectors. This diagram shows the hole pattern as viewed from the top, inside the housing.



VIEW FROM INSIDE OF READER LOOKING DOWN

1 CENTURY JJ WITH 50.8 MM (2 INCH) BOLT PATTERN REEL ARM ADAPTER
SIMPLEX 35

2 CHRISTIE
CENTURY 35

3 SIMPLEX 35 - 70

4 CINEMECCANICA V4, V5, V8 (35 mm), V9

5 CINEMECCANICA V8 (70 mm)

Figure 2.1 Mounting hole bolt pattern

3. Remove the six screws which hold the back cover/power supply assembly onto the Digital Soundhead. Carefully remove the LED connector. Put the assembly in a safe place.

4. Remove the upper reel arm or guide rollers from the projector on which the Digital Soundhead is to be mounted.

5. If an adapter kit is necessary, mount the adapter plate to the top of the projector. In the case of the Cat. No. 690 adapter kit, the reader attaches to the projector and the adapter plate attaches to the top of the reader.

6. Mount the Digital Soundhead to the projector body (or adapter plate) matching the appropriate set of bolt holes for the projector type.

If you intend to use **Hole Pattern 1**, then place three 3/8" flat washers (provided) under the hex head bolt as shown, to provide better wrench access.

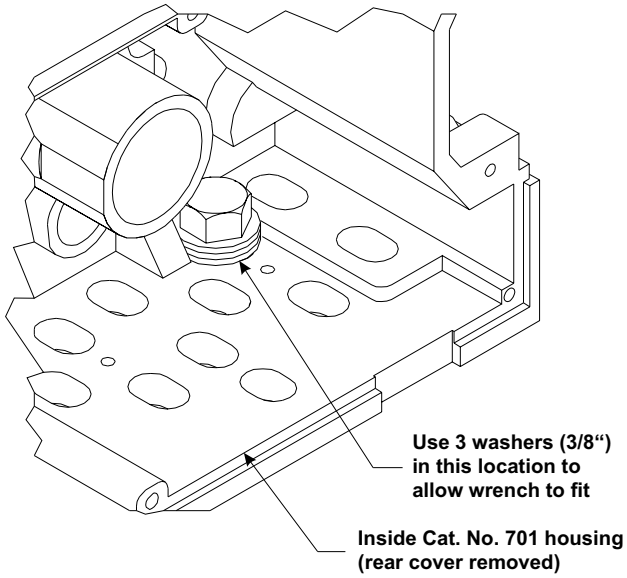


Figure 2.2 Flat washer installation

NOTE: When two Cat. No. 701 Digital Soundheads are mounted for use in a two-projector installation, care must be taken to ensure that the film path lengths between the Digital Soundhead and the picture gates in the two projectors are identical. The soundhead delay setting in the cinema processor is adjusted for correct synchronization of sound and picture during installation. Since only one adjustment is provided, both projectors must have the same film path length from the Digital Soundhead to the picture gate.

7. Reattach the upper reel arm or guide rollers to the Digital Soundhead, using an adapter plate if necessary.

8. Thread film through the Digital Soundhead and first few rollers and sprocket of the projector and adjust the placement of the Digital Soundhead such that there is equal tension on each edge of the film, then firmly; tighten the mounting bolts.

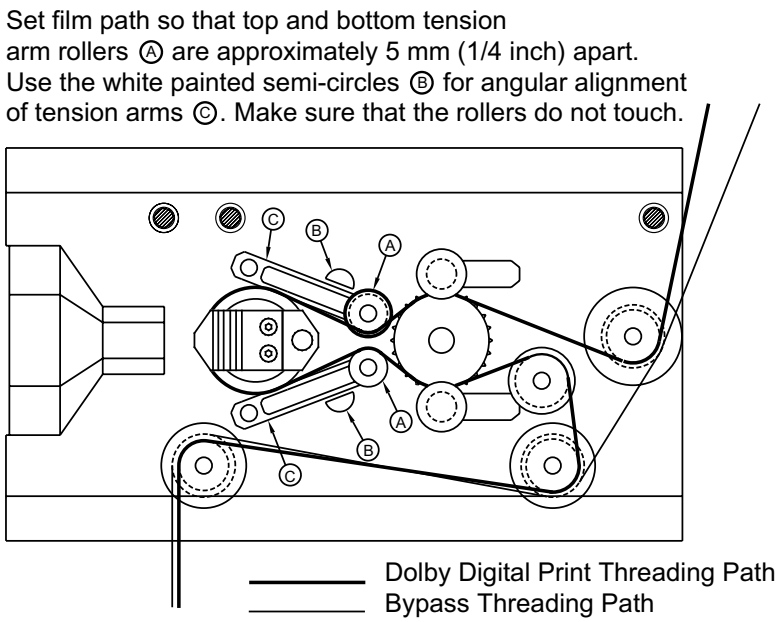


Figure 2.3 Film threading

9. If desired, route appropriate conduit from the sound rack where the cinema processor is to be installed, terminating the conduit at the end of the Digital Soundhead. The soundhead has an unthreaded 27 mm diameter hole in a 2 mm plate to accept 3/4" (U.S.) conduit fittings or 25 mm (Europe) conduit adapters. Be sure to follow all local electrical codes.

10. Remove the shipping collar using the supplied hex wrench, and install the Digital Soundhead flywheel. Reach around and hold the sound drum to prevent the shaft from sliding out and hitting the LED bracket. The flywheel is packed separately for shipping (see **Figure 2.4**). Take care not to lose the spring on the shaft.

11. Replace the cover/power supply assembly.

12. Route the video cable to the soundhead (see Section 2.2).

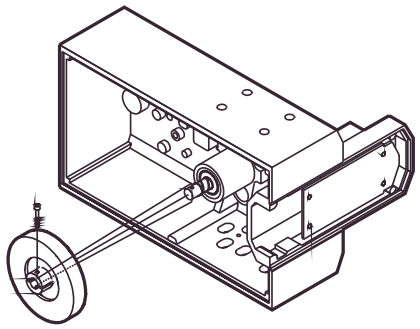


Figure 2.4 Flywheel mounting

2.2 Electrical Connections to the Digital Soundhead

LED Power

The Cat. No. 701 Digital Soundhead comes equipped with a mains-operated power supply to drive the LED light source. This supply is powered via an IEC mains connector mounted on the rear of the digital soundhead. A 2 meter power cord is included. Outside North America the appropriate connector (not supplied) must be attached to the power cord. See Section 1 for the required mains connector wiring. The power supply operating range is 85-265 Vac, 50-60 Hz.

Video Cable Assembly

A shielded computer-grade video cable connects the Cat. No. 634R CCD Board in the Digital Soundhead to the cinema processor. The standard cable is 10 m (about 30 feet) long. Other cable lengths are available:

30 m (about 100 feet) Part Number 83142
15 m (about 50 feet) Part Number 83237

The video cable is supplied with hardware (shown in Figure 2.5) pre-assembled to the digital soundhead end of the cable, and a male DB25 connector is assembled to the cinema processor end of the cable.

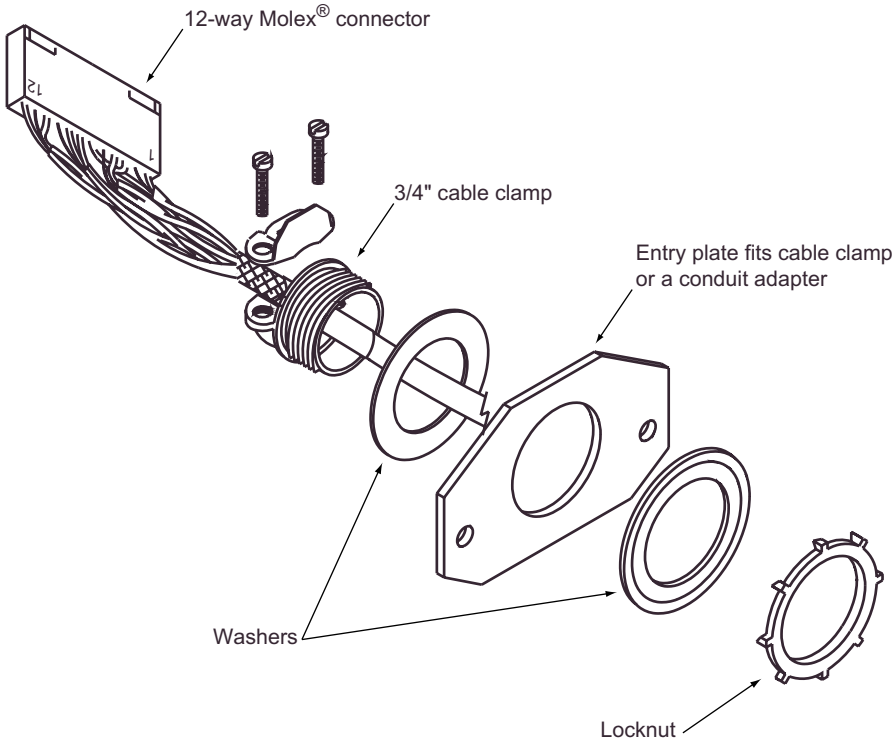


Figure 2.5 Video cable mounting assembly

NOTE: The cable must be pulled through grounded metal conduit or other shielded wireway to meet EMI emission standards. If conduit is used for cable routing then the supplied cable clamp must be removed and replaced with a conduit adapter. Remove the individual wires from the 12-way Molex connector by inserting a small-blade screwdriver into the side hole at each pin position and carefully pulling the wire/contact out of the connector. After inserting the cable through the new conduit adapter, re-install the wires into the connector. The wiring order is shown in Appendix A, steps 11 and 12.

Three ferrite blocks are shipped with the Cat. No. 701. If the cable is installed in conduit, place the blocks at the cinema processor end. If you have chosen not to use conduit, then installation of these blocks is essential for preventing excessive RF energy radiation and should be placed near each end of the cable.

Plug the Molex connector onto the CCD board in the Digital Soundhead before plugging the male DB25 connector onto the Dolby processor.

Chapter 3
Replacing the LED Assembly

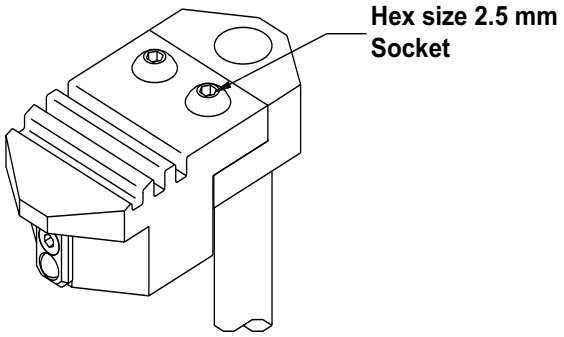
3.1 Introduction

In normal operation, the LED assembly used in the Cat. No. 701 Digital Soundhead will exhibit gradually reduced light output over its life. If it becomes necessary to replace the LED then follow the procedure outlined below. The LED assembly is Dolby Part Number 83308.

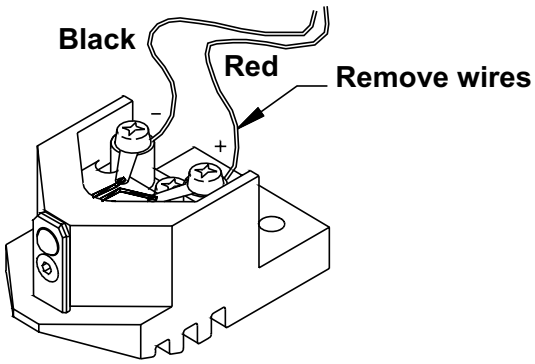
3.2 Installation

1. Turn off power to the Cat. No. 701 soundhead.

2. Remove the two screws that mount the LED assembly to the arm and carefully pull the LED assembly off of the pivot pin.

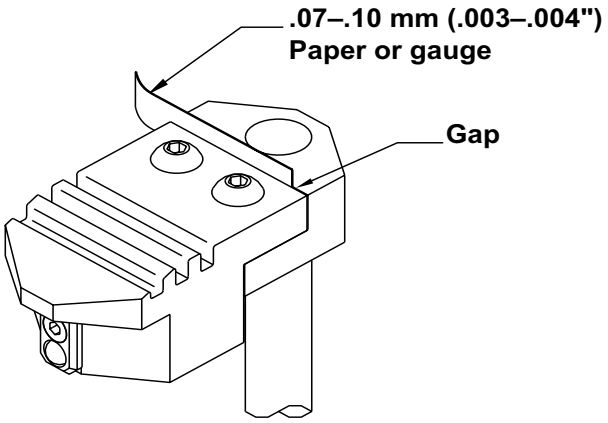


3. Carefully turn over the assembly and loosen the two screw terminals then remove the wires. **Note the wire colors and terminal locations.**



4. Attach the wires to the replacement LED assembly using the same wire locations as in the original LED assembly. The wires may require restripping since they have been compressed previously, and could be too weak. Inspect the wires carefully before attaching them to the terminals.

5. Remount the LED assembly onto the pivot pin. Initial adjustment can be made by tightening the screws slightly with a parallel gap between the rear of the LED assembly and the facing edge of the arm. Using a sheet of paper will usually provide the proper clearance.



3.3 Alignment

Class 2 LED Product per EN 60825-1:1996. Do not stare into the red LED beam. Do not attempt to view the LED beam with any type of optical device.

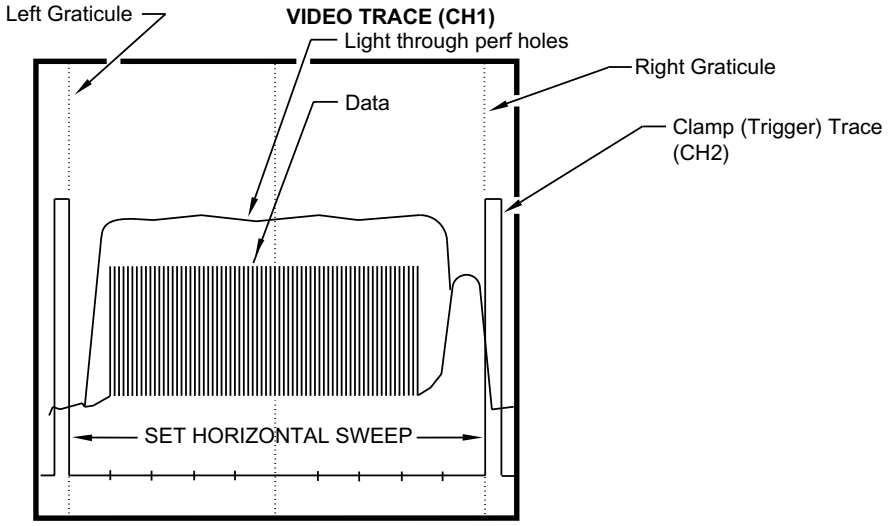
1. Connect an oscilloscope (20 MHz minimum bandwidth) to test points on the video acquisition card (Cat. No. 670). Some digital oscilloscopes may not be usable for this procedure even though they may have the required bandwidth.
    a. Ensure that the probes are 1X. Connect scope Channel 1 to the **Video** test point (TP1). Connect only this probe's ground to the V**Gnd** test point (TP2).
    b. Connect scope Channel 2 to the **Clamp** test point (TP3).
    c. Set both channel vertical input sensitivity controls to 1 Volt/div, DC coupling. Set the vernier to **calibrated** (usually the inner knob- rotate until it "clicks").
    d. Set horizontal sweep rate to 2 μsec/div.
    e. Set the trigger source to Channel 2 and positive polarity.
    f. Turn on power to the digital soundhead and Dolby digital processor.

2. Set the oscilloscope display
    a. Thread and play a Cat. No. 69T Dolby tone test film loop.
    b. Display only Channel 2, and adjust trigger level to lock on to the clamp signal.
    c. Adjust horizontal position to line up inside edge of left clamp signal with left screen graticule.
    d. Adjust the time base sweep vernier to line up the inside edge of right

clamp signal with right screen graticule.

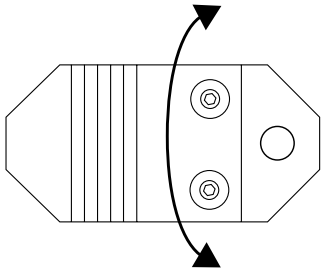
e. Select Channel 1 display.

f. Temporarily switch the scope channel 1 input (video) to GND and adjust the vertical position to coincide with a horizontal screen graticule. This is the 0 V reference baseline.



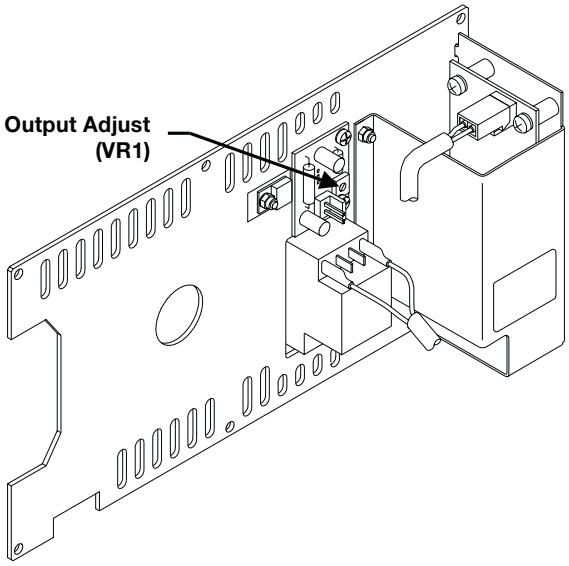
3. Adjust the LED Position

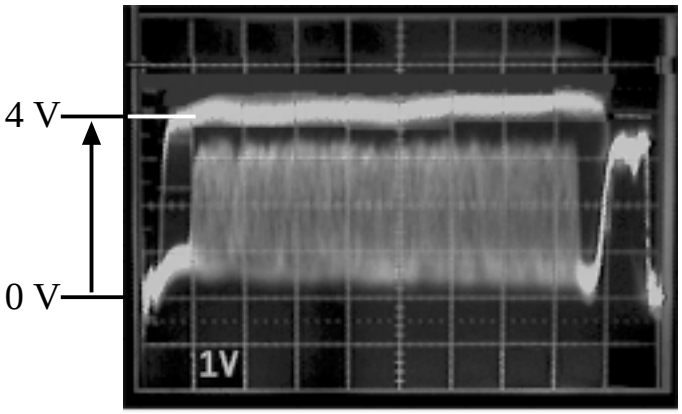
   a. Switch the Channel 1 video input coupling back to DC.



   b. Loosen the 2.5 mm hex screws and carefully rotate the LED assembly while watching the scope image. Adjust for maximum video signal voltage (unobstructed light through the perf hole) on the **upper trace**. Also, the waveform must be reasonably flat (fit within one scope major division). In other words, adjust for peak voltage with minimum ripple.

4. Check / Set LED drive current
   The optimum peak video signal voltage (unobstructed light through the perf hole) is **4 V**, measured from the 0 V reference baseline to the **upper trace**. If necessary, adjust the Cat. No. 701 power supply output to achieve the correct video voltage. See the figure below for adjustment location (VR1). The back cover of the digital soundhead must be removed to gain access to the output adjustment.





Appendix A
Making a Custom Video Cable

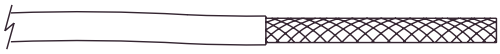
The following information is included for use when a cable is being made up on site. The cable should be Belden Datalene® 8164, which contains four shielded twisted pairs of computer-grade cable with the shields isolated from each other plus a 100% coverage overall shield. Using other types of cable may result in unsatisfactory operation. The overall shield is necessary to prevent RF interference signals from radiating from the video cable, and to meet government EMI standards. A metal shell MUST be used on the D-connector and the overall shield MUST be grounded to the connector shell to ensure proper operation and compliance with EMI regulations.

Wiring table for the video cable

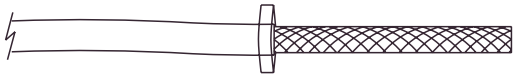
D-connector pin no.	Molex pin no.	Wire Color	Shield Description	Signal name
1				n.c.
2				n.c.
3				n.c.
4	7	Blue	Pair number 3	TTC
5	9	Shield	(Blue shield)	TC GND
6	8	Black		FTC
7	10	White	Pair number 4	TSC
8	11	Shield	(Green shield)	SC GND
9	12	Black		FSC
10				n.c.
11				n.c.
12				n.c.
13				n.c.
14	1	Black	Pair number 1	Video 0
15	2	Shield	(Red shield)	GND
16	6	Red		+15 V
17	3	Black	Pair number 2	Video 1
18	5	Shield	(Blue shield)	GND
19	4	Green		–15 V
20				n.c.
21				n.c.
22				n.c.
23				n.c.
24				n.c.
25				n.c.

Wiring to the Molex Connector

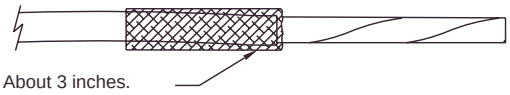
1. Strip back vinyl outer jacket of cable to 3.0 inches.



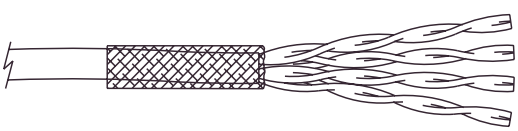
2. Add 1/2 inch diameter heat-shrink about 1/4 inch long near end of vinyl outer jacket.



3. Fold outer shield braid back over vinyl outer jacket.

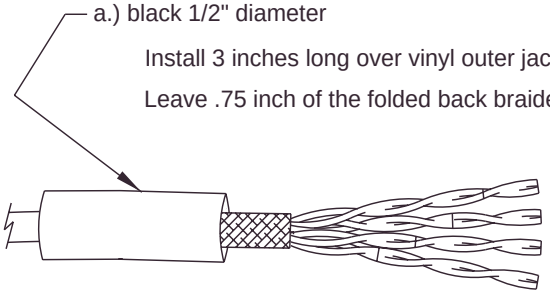


4. Trim back outer foil shield and plastic cords.



* foil color may vary depending upon cable manufacturer

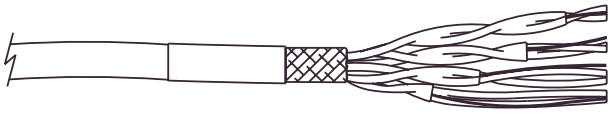
5. Install shrink tubing.



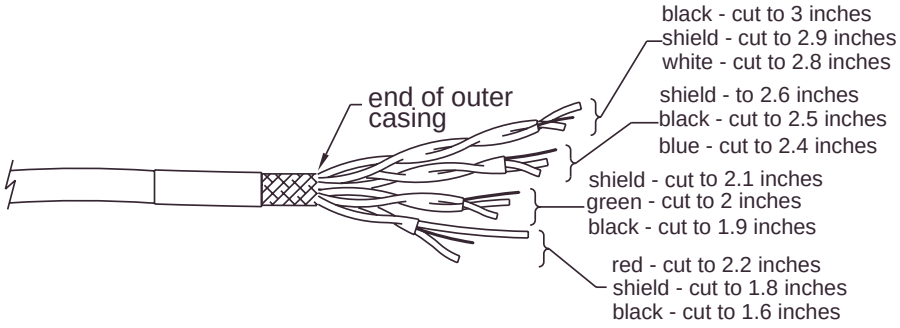
b.) clear 1/8" diameter

2.4 inches on foil covering with black & white *
2 inches on foil covering with black & blue *
1.5 inches on foil covering with black & green *
1.2 inches on foil covering with black & red *

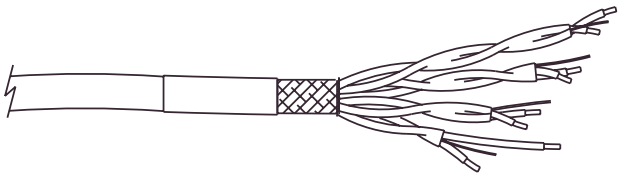
6. Strip back foil to edge of 1/8 inch shrink tubing.



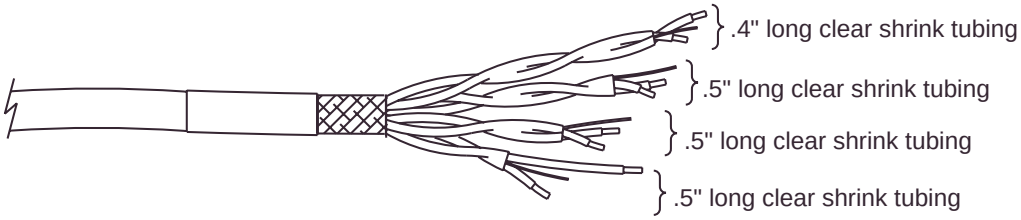
7. Cut exposed wiring and twisted shield to the lengths indicated below; measuring from end of the outer cable casing.



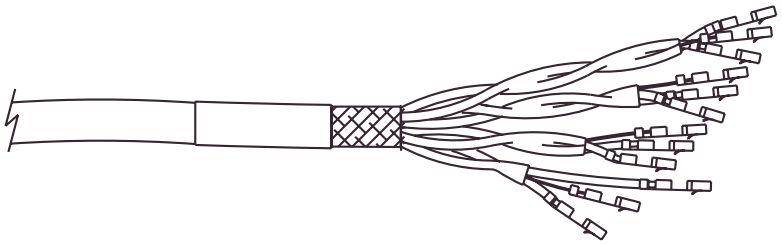
8. Strip insulated wires back .12 inch.



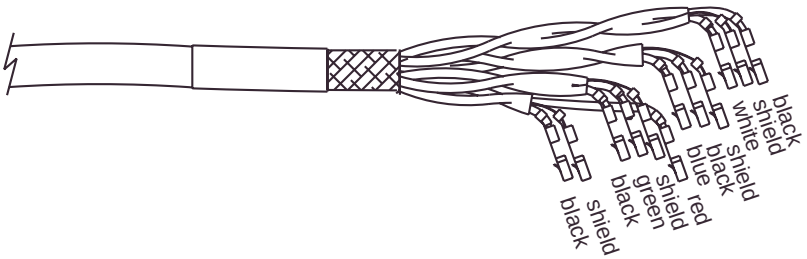
9. Install 1/16 inch diameter clear shrink tubing over each drain wire of the twisted pairs and heat shrink.



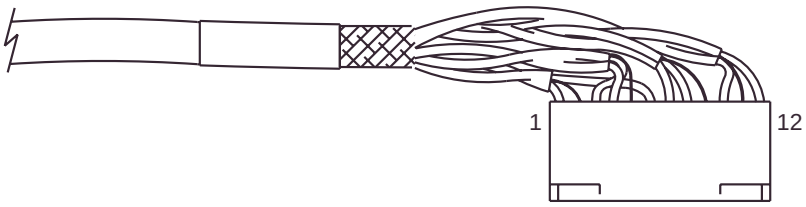
10. Crimp Molex pins onto wires, 12-PL, using Molex tool HTR-2262-20A, then solder pins to wires.



11. Arrange wires in the following order and bend them 90 degrees as shown.



12. Install pins into Molex housing according to wiring table.



The pins must be inserted in the Molex connector block as shown in the following table.

Perform this operation before plugging the male DB25 connector into the cinema processor. Incorrect placement of pins will result in damage to the Cat. No. 634R CCD board or the Cat. No. 670 video acquisition board.

Pin 1 is on the left when the Molex connector is connected to the Cat. No. 634R CCD Board in the Cat. No. 701 Digital Soundhead. This assembly is easiest if you insert the shortest leads first.

Wiring table for inserting pins in Molex connector block

Molex pin no.	Wire color	Cable Pair shield color	Signal name
1	Black	Red	Video 0
2	Shield	Red	GND
3	Black	Blue	Video 1
4	Green	Blue	–15 V
5	Shield	Blue	GND
6	Red	Red	+15 V
7	Blue	Blue	TTC
8	Black	Blue	FTC
9	Shield	Blue	TC GND
10	White	Green	TSC
11	Shield	Green	SC GND
12	Black	Green	FSC

The cable clamp which is attached to the Cat. No. 701 cable mounting plate, along with the exposed braid on the video cable, provide an electrical ground path for the shield of the video cable.

This video cable shield may be isolated if necessary by loosening the two screws which clamp the video cable shield and installing an insulator around the braided shield (such as 1/2 inch diameter heat shrink tubing). It is important to retighten the cable clamp after installing the insulation to provide strain relief for the video cable.