

## Pinouts

### AC Outlet

On a polarized plug, the smaller of the two blades is the hot wire and the larger is the neutral.



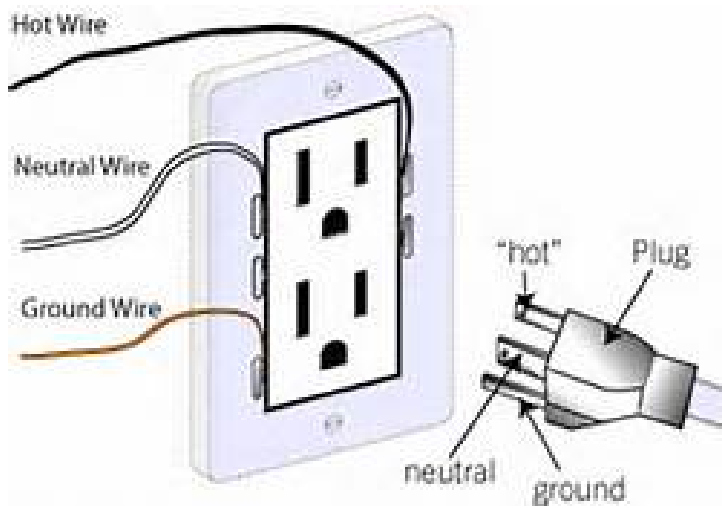
NEMA 1-15 Non-Polarized plug

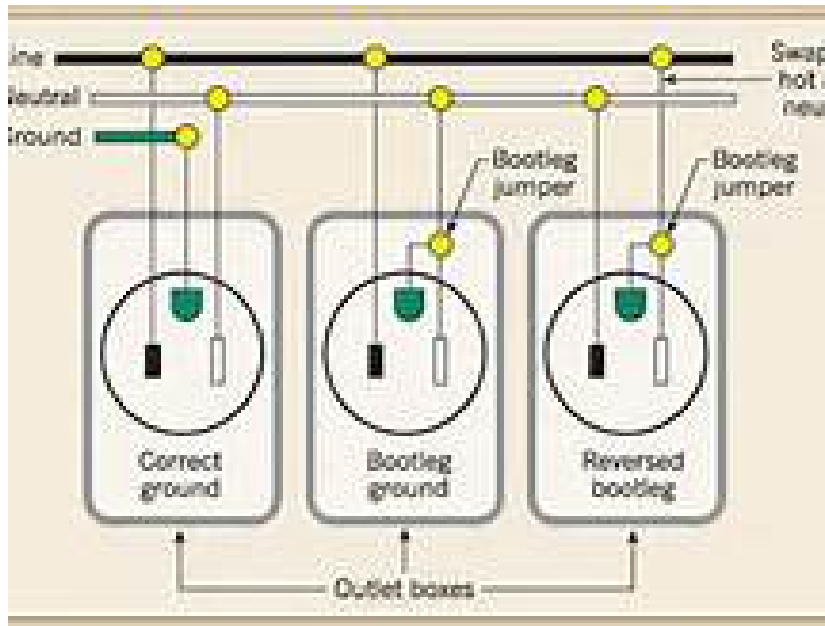


NEMA 5-15 – Standard ground plug and outlet



NEMA 5-20 – Standard ground outlet with 20 amp capability





## Phono Connectors (RCA)

Following is the common or standard wiring pinout for an RCA connector.

Tip	(+)
Ground	(-)

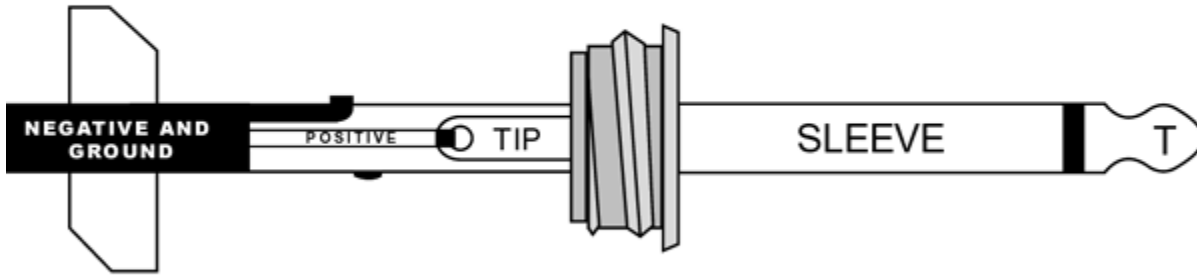
## 1/4" Mono

Tip: hot (non-inverting)  
 Sleeve: low (inverting)  
 Sleeve: Shield (ground)

## 1/4" Phone - 2 Circuits/TS

Following is the common or standard wiring pinout for two circuit 1/4" Phone connectors.

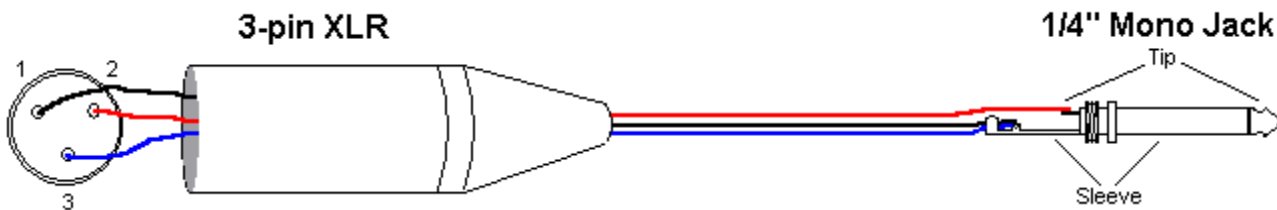
PHASE	Termination Point
POSITIVE (+)	TIP
NEGATIVE (-)	SLEEVE
SIGNAL GROUND	SLEEVE



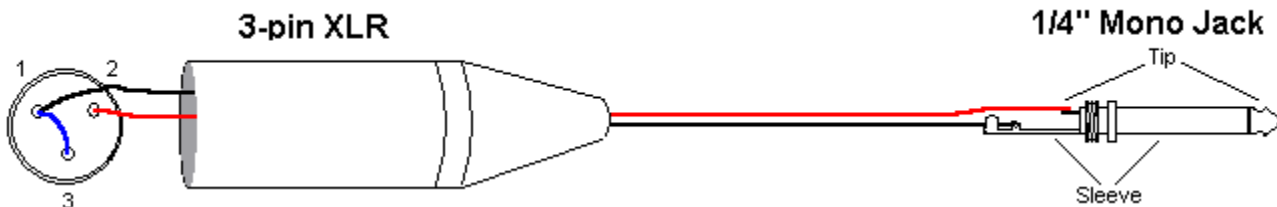
### 1/4" T.S. PHONE PLUG (SWC-280/285 STYLE)

## XLR to 1/4" Mono Jack

The most common way to wire a 3-pin XLR to a 1/4 inch mono jack (or 6.5mm jack), is to join the -ve and shield together. This can be done by either soldering the shield and -ve wires to the sleeve of the jack.....



Or by soldering a jumper on the XLR.....



Either way gives you the same result: An unbalanced audio cable.

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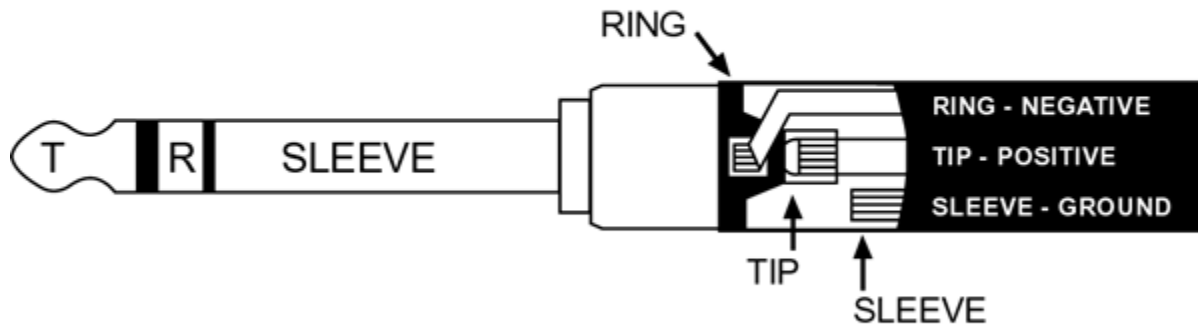
## **1/4" TRS**

Tip: hot (non-inverting)  
Ring: low (inverting)  
Sleeve: Shield (ground)

## **Balanced Line (Neutrik - NP3C Style)**

Following is the common or standard wiring pin out for 1/4" connectors.

PHASE	Termination Point
POSITIVE (+)	TIP
NEGATIVE (-)	RING
SIGNAL GROUND	SLEEVE

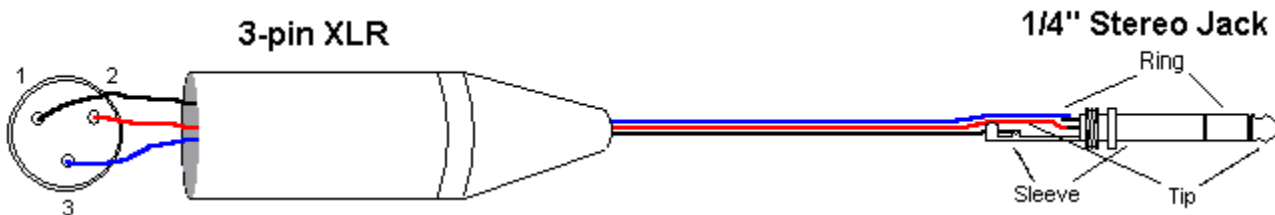


## 1/4" T.R.S. PHONE PLUG (NEUTRIK - NP3C STYLE)

### XLR to 1/4" Stereo Jack (wired for balanced mono)

The usual way to connect a 3-pin XLR to a 1/4" stereo jack is to use the following pin allocation:

- XLR pin 1 to jack sleeve
- XLR pin 2 to jack tip
- XLR pin 3 to jack ring



This wiring configuration gives you a balanced mono audio cable.

### Send and Return Circuits Unbalanced

Following is the common or standard wiring pin out for 1/4" connectors.

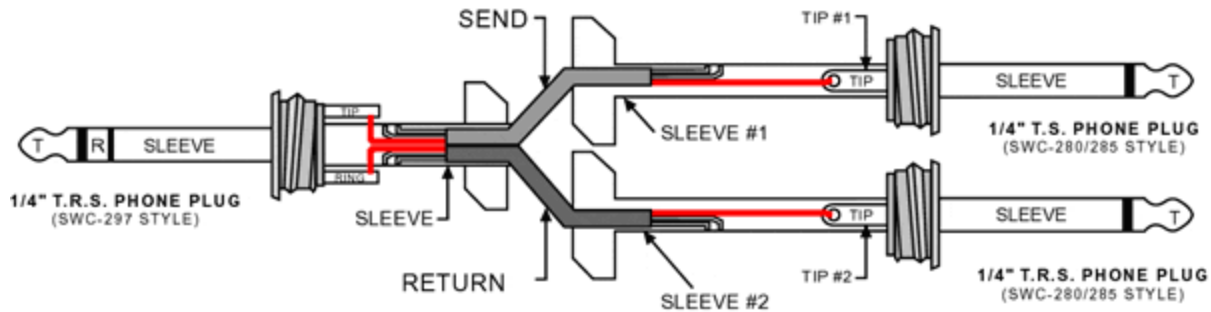
Sleeve	Common (ground)
Tip	Send
Ring	Return

## 1/4" Phone - 3 Circuits/TRS

Following is the common or standard wiring pin out for 1/4" Phone connectors.

PHASE	Termination Point
POSITIVE (+) ON SEND	TIP
POSITIVE (+) ON RETURN	RING
BOTH NEGATIVES BOTH SIGNAL GROUNDS	SLEEVE

PHASE	Termination Point
POSITIVE (+) ON SEND	TIP #1
BOTH NEGATIVE (-) AND GROUND ON SEND	SLEEVE #1
POSITIVE (+) ON RETURN	TIP #2
BOTH NEGATIVE (-) AND GROUND ON RETURN	SLEEVE #2



4 pin 3.5mm (2.5mm) plug connector at the iPhone (2.5mm or 3.5mm, depends on model)

## iPhone headphone (handsfree)

Pin Number	Pin Name	Description
1	Tip	Left audio
2	Ring	Right audio
3	Ring	Common/Ground
4	Sleeve	Microphone

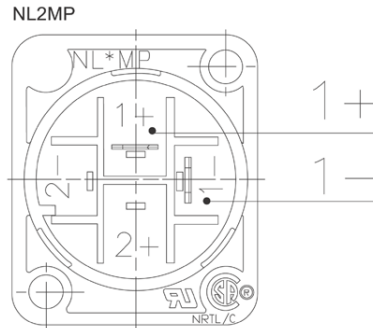
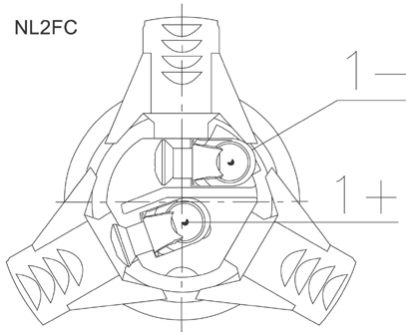
Pressing the headset button shorts Microphone to Ground

Inserting a 3-pin plug into the iPhone's 4-pin receptacle would also short Mic to Common and the L/R earphones will work correctly.

## Speakon

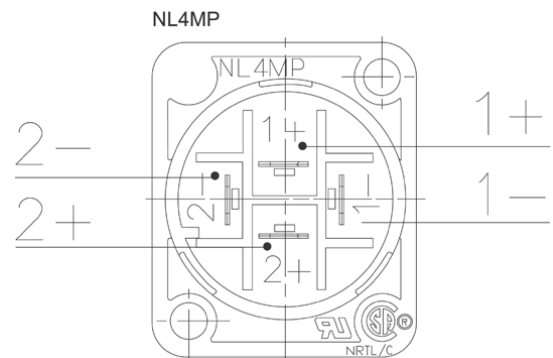
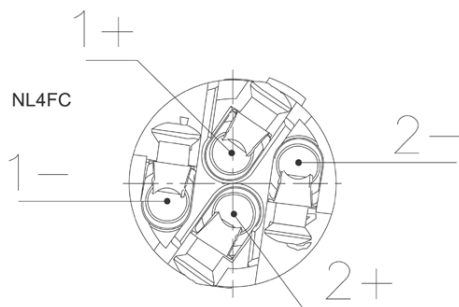
## Single Driver

Pin1	Positive (+)
Pin 1	Negative (-)
Pin 2	Positive - No Connection
Pin 2	Negative - No Connection



## Dual Driver (two channels of the same signal)

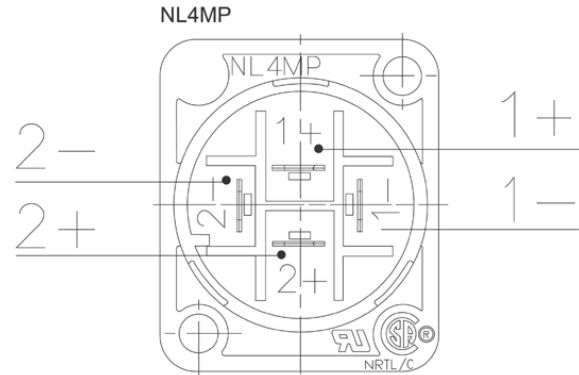
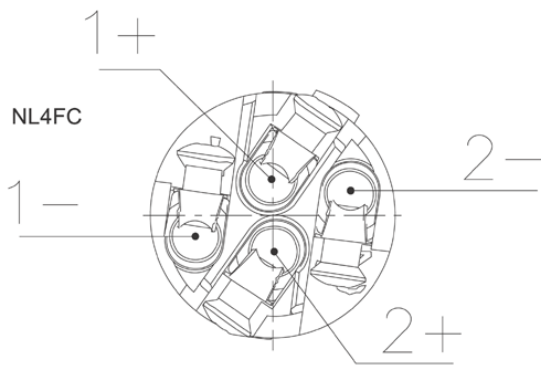
Pin1	Positive driver 1 (+)
Pin 1	Negative driver 1 (-)
Pin 2	Positive driver 2 (+)
Pin 2	Negative driver 2 (-)



## Speakon (continued)

## Bi-amp or Stereo (two channels of differing signal)

Pin 1	Positive low frequency or left (+)
Pin 1	Negative low frequency or left (-)
Pin 2	Positive high frequency or right (+)
Pin 2	negative high frequency or right (-)



Pin Name	Pin Number	Description
1+	Positive 1	This pin carries the signal from amp to the speaker
1-	Negative 1	This pin carries the negative back to the amplifier (of channel one)
2+	Positive 2	Second positive from amp
2-	Negative 2	Second negative back to amplifier from speaker (of channel 2)

**The XLR connectors** are used mostly in professional audio and video electronics cabling applications. Home audio and video electronics normally use RCA connectors. There is no common pinout - it depends on application.





3 pin XLR female connector

Balanced Audio (3 pole XLR):

Pin	Signal	Description
1	Ground / Screen	
2	In phase / +ve / Hot	
3	Out of phase / -ve / Cold	

Unbalanced Audio (3 pole XLR):

Pin	Signal	Description
1	Ground / Screen	
2	Signal	
3	Ground / Screen (connect to pin 1)	

Application	Pin 1	Pin 2	Pin 3	Notes
D54	Screen	No connection	Signal (analogue multiplex)	Strand analog multiplex - 384 channels Sometimes uses an XLR4 connector for compatibility with AMX192
DMX512 (DMX)	Screen	Data -	Data +	Digital multiplex - 512 channels Standard connector is the XLR5
TecPro Backbone	Earth/ Screen	Power +24VDC	Audio	

Audio Signal (European)	Screen	Signal + (Hot)	Signal - (Cold)	
Jem TechnoHaze	Black	Yellow	White	Remote from above (cable rear)
Canford Talkback backbone	earth/screen	+24V DC	audio	
High End Systems intelligent fixtures control	ground	data -	data +	
Martin intelligent fixtures control (old)	screen	data +	data -	This is not the same as 3-pin DMX!
Martin intelligent fixtures control (new)	screen	data -	data +	Martin have now changed to be pin compatible with 3-pin DMX
Microphones (Europe standard)	screen	signal +	signal -	
Microplex	common	+15 VDC	data	

## 4-pin XLR



4 pin XLR  
female connector



4 pin XLR  
male connector

Application	Pin 1	Pin 2	Pin 3	Pin 4	Notes
AMX 192	screen (analogue 0V)	clock +	analogue multiplex	clock -	
Canford Talkback 1cct headset	Mic earth/scr	Mic signal	Earphones earth/scr	Earphones signal	
Clearcom talkback headset	Mic earth/scr	Mic signal	Earphones earth/scr	Earphones signal	
Diversitronics (analogue) superstrokes	signal	ground	supply (+ve)	not used	
Pyro Pack Control	channel 1	channel 2	channel 3	common	
Rosco gobo rotator	Forward A	Reverse A	Forward B	Reverse B	
Scroller (generic)	ground	-ve data	+ve data	+24VDC or +48VDC power	NOT Wybron!
Wybron Scroller	+24v DC	-ve data	+ve data	ground	Non- standard!



5 pin XLR female connector



5 pin XLR male connector

Application	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Notes
AVAB	Signal Ground	Data -	Data +	No Connection	No Connection	AVAB Digital protocol 256 Channels
CCT Regal II (Dimmer Control)	0 Volts	DMX Data -	DMX Data +	12V AC Desk Supply from dimmers	No Connection	Using external PSU disconnects Pin4 internally
CCT Regal II (Coloursette Control)	0 Volts	DMX Data -	DMX Data +	12V AC Desk Supply from PSU	No Connection	
CMX	Signal Ground	Data -	Data +	No Connection	No Connection	Colortran Digital protocol 512 Channels
DMX512	Screen	Data - Primary	Data + Primary	Data - Secondary	Data + Secondary	USITT digital multiplex - Pins 4&5 have no standard use 512 channels
PMX	Screen	Signal	Signal Earth	No Connection	Power +18-25VDC	Pulsar multiplex Based on EIA-232 standard
SMX	Screen	Data -	Data +	No Connection	No Connection	
Strand Colour Call Scroller	DMX OV	DMX +	DMX -	OV Power	+V Power	Early versions used an XLR4 with the screen carrying the +V power
TecPro 2ch Headset	Mic Screen	Mic Signal	Headphone Screen	Headphone Signal Left	Headphone Signal Right	

## 6-Pin XLR



6 pin XLR  
female connector



6 pin XLR  
male connector

Application	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Notes
Canford Talkback multicircuit backbone	earth/scr	+24V DC	audio 1	audio 2	audio 3	audio 4	
Compulite Riggers Remote	ground	data from remote	data to remote	+12V	-12V	not used	
Strand GSX /LBX rigger's remote	earth/scr	+10V	data +485	data - 485	232 Rx	232 Tx	



5 pin DIN female connector at the peripheral



5 pin DIN male connector

Peripheral	Connected	In L	In R	Out L	Out R	Ground
Amplifier	Pickup, tuner	3	5			2
Amplifier	Taperecorder	3	5	1	4	2
Tuner	Amplifier			3	5	2
Tuner	Taperecorder			1	4	2
Recordplayer	Amplifier			3	5	2
Taperecorder	Amplifier	1	4	3	5	2
Taperecorder	Receiver	1	4	3	5	2
Taperecorder	Microphone	1	4			2

## 6-pin DIN Audio



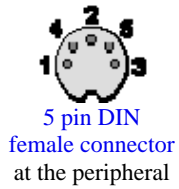
6 pin DIN male connector



6 pin DIN female connector

Application	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Notes
Compulite Riggers Remote	ground	data from remote	not used	data to remote	+12V	-12V	
CCT Regal II Desk PSU	0V	not used	not used	DMX +	24V AC	DMX -	
Green Ginger DMX	ground	DMX 1 true	DMX 1 complement	DMX 2 true (not used)	DMX 2 complement (not used)	supply +ve	
Green Ginger/Lightprocessor analogue control	channel 1	channel 2	channel 3	channel 4	+ve supply	ground	

MIDI=Musical Instrument Digital Interface.

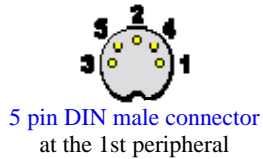


MIDI is a digital communications protocol, introduced in 1983 by a group of musical instrument manufacturers.

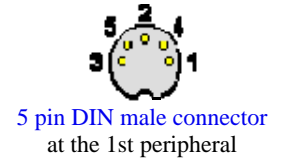


Pin	Name	Description
1	n/c	Not connected
2	n/c	Not connected
3	n/c	Not connected
4	CSRC	Current Source
5	CSINK	Current Sink

## MIDI Cable Schematic



	1st	2nd
Shield	2	2
Current Source	4	4
Current Sink	5	5

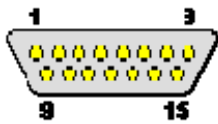
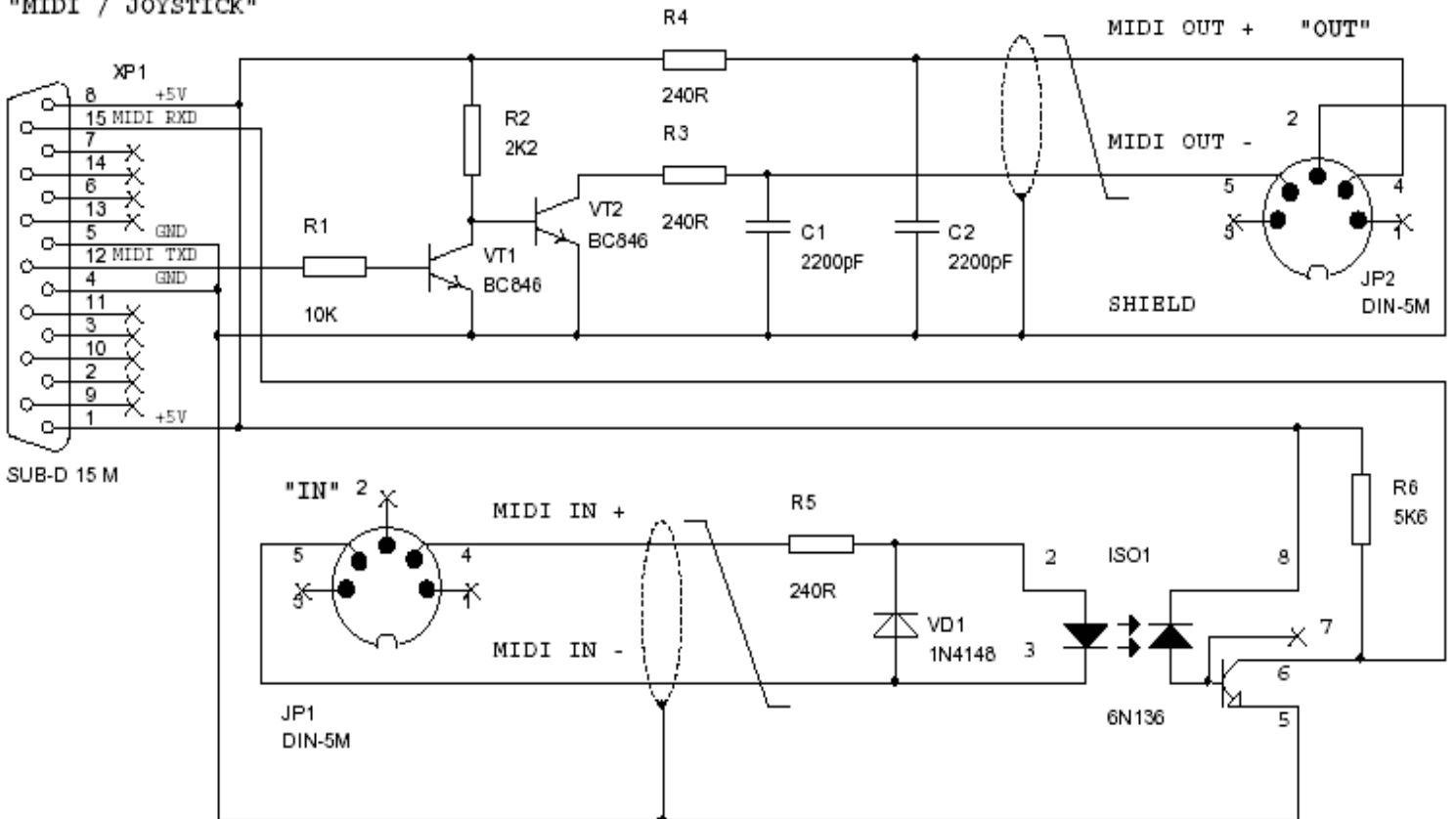


Note: Although pin 2 only is connected at MIDI Out, it's simpler to connect it to both ends.

## PC to MIDI Cable

'AMK-03' cable

"MIDI / JOYSTICK"



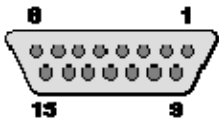
15 pin D-SUB male connector  
at the computer



5 pin DIN male connector  
at the MIDI device

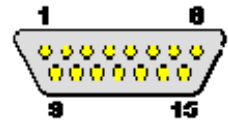


**The game port** is the traditional connection for video game input devices on an x86-based PCs. The game port is an on-board feature of many motherboards but may be integrated with a PC I/O or sound card.



15 pin D-SUB female connector at the computer

Game ports use DB-15 connectors, and usually double as connectors for MIDI instruments. To use a game port with MIDI instruments, one must obtain a cable with both DB-15 and 5-pin DIN connectors (similar to old-style pre-PS/2 keyboard connectors known as Baby AT or AT5 connectors).

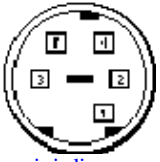


15 pin D-SUB male connector at the joystick cable

Pin	Name	Dir	Description
1	+5V	→	+5 VDC
2	/B1	←	Button 1
3	X1	←	Joystick 1 - X
4	GND	—	Ground
5	GND	—	Ground
6	Y1	←	Joystick 1 - Y
7	/B2	←	Button 2
8	+5V	→	+5 VDC
9	+5V	→	+5 VDC
10	/B4	←	Button 4
11	X2	←	Joystick 2 - X
12	MIDITXD	→	MIDI Transmit
13	Y2	←	Joystick 2 - Y
14	/B3	←	Button 3
15	MIDIRXD	←	MIDI Receive

## miniDIN to DIN adapter for Creative LivedriveII MIDI IN and MIDI OUT pinout

With this adapter, you can connect a MIDI instrument with standard cables to the Creative LivedriveII



5 pin mini-din connector  
at the LivedriveII female  
miniDIN

LivedriveII female miniDIN Pin Name	LivedriveII female miniDIN Pin Number	Direction	Male 5 pin DIN of MIDI cable Pin Number	Male 5 pin DIN of MIDI cable Pin Name	Description
NC	4	---	2	Shield	
Current source	5	---	4	Current Source	
Current Sink	6	---	5	Current Sink	
NC	1	---	1	NC	
NC	3	---	3	NC	



5 pin DIN female connector  
at the Male 5 pin DIN of  
MIDI cable

5 pin mini-DIN male is equal to 6 pin mini-DIN male PS/2 without pin 2. Tested with CASIO Keyboard.

**DMX** (Digital MultipleX) is a communications protocol used mainly to control stage lighting. It is a form of the RS-485 architecture.



5 pin XLR male connector

Latest ESTA standard (approved by ANSI) known as "Entertainment Technology — USITT DMX512-A — Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories", also known as "E1.11, USITT DMX512-A", or just "DMX512-A".

DMX is the primary method for linking controllers, dimmers, advanced fixtures and special effects devices such as foggers and moving lights. A DMX512 controller is connected to fixtures or devices in a daisy-chain link. Each device has a DMX in and generally a DMX out XLR 5 pin connector - sometimes marked as DMX thru. The DMX out on the controller is linked via a DMX512 cable to the DMX in on the first fixture. A second cable then links the DMX out on the first fixture to the next device, and so on - up to 512 devices. In general, the final, empty, DMX out connector should have a DMX512 terminating plug attached into it, which is simply a 120ohm resistor joining pins 2 and 3 of the connector. Many modern devices negate this requirement, as they are capable of auto-terminating the link.

Pin	Signal	Description
1	Signal Common	
2	Data Minus	
3	Data Plus	
4	Not used	
5	Not used	Originally intended for feeding diagnostic data back to the DMX512 controller, but never been implemented. Sometimes used to carry other data or power

DMX512 Data are sent using RS-485 voltage levels and cabling practices. Data are transmitted serially at 250 kbit/s and is grouped into packets of up to 513 bytes. Data are sent with 1 start bit and 2 stop bits, LSB first.

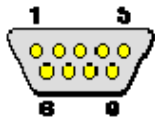
The start of a packet is signified by a break of at least 88 uS. Receivers detect the break and reset their Receiving code. Then up to 513 bytes are sent. The first byte is always the "Start code" byte. This tells receivers which kinds of data are being sent. For normal dimmer/level data, a start code of 0x00 is used. Other start codes are used for proprietary systems or for the RDM extension to DMX.

The remaining bytes make up the actual level data. Up to 512 bytes can be sent, and it is the job of the receiver to count the bytes to keep track of the channels. As there is no error detection or correction in DMX, it is vitally important for receivers not to miss bytes, and to discard packets if framing or buffer overflow errors are detected. A full packet takes approx. 23 mS to send (44 Hz refresh rate) - for higher refresh rates fewer channels can be sent.

Moving lights use adjacent DMX512 channels to control different aspects of their behavior. Modern DMX512 controllers have libraries of data about fixtures telling them how to map attributes to DMX512 channels. The controller could then have separate ways of selecting gobos and gobo rotation, even though on a particular fixture they are controlled by a single DMX512 channel.

The DMX512 output is designed to feed 32 'units' of load. A single fixture may represent a fraction of a unit of load; however the cabling in between the fixtures can degrade the signal significantly. To deal with this, and cable management issues, DMX512 buffers are often used. These have one DMX512 in but many DMX512 outs, all feeding identical data. Each output from the DMX512 buffer can feed 32 units, so by using DMX512 buffers it is possible to split the signal from a controller to hundreds of fixtures.

**PC DMX pinout for Martin Lightjockey** interface card - common for professional lighting use the Martin professional Lightjockey software with DMX interface, this are the pinout for the one (512ch) or four (2048ch) universes corresponding to the version dj or club.



9 pin D-SUB male connector  
at the XLR Terminal

d-sub 9 Pin	Name	Description
1	-	XLR Male Pin 1 (Negative) [universe 2+4]
2	+	XLR Female Pin 3 (Positive) [universe 1+3]
3	earth	XLR Female Pin 2 (Positive) [universe 1+3]
5	-	XLR Feale Pin 1 (Negative) [universe 1+3]
6	earth	XLR Male Pin 2 (ground) [universe 2+4]
9	+	XLR Male Pin 3 (Positive) [universe 2+4]

## VHS Video Camera Out



10 pin DIN female connector  
at the video camera (facing you)

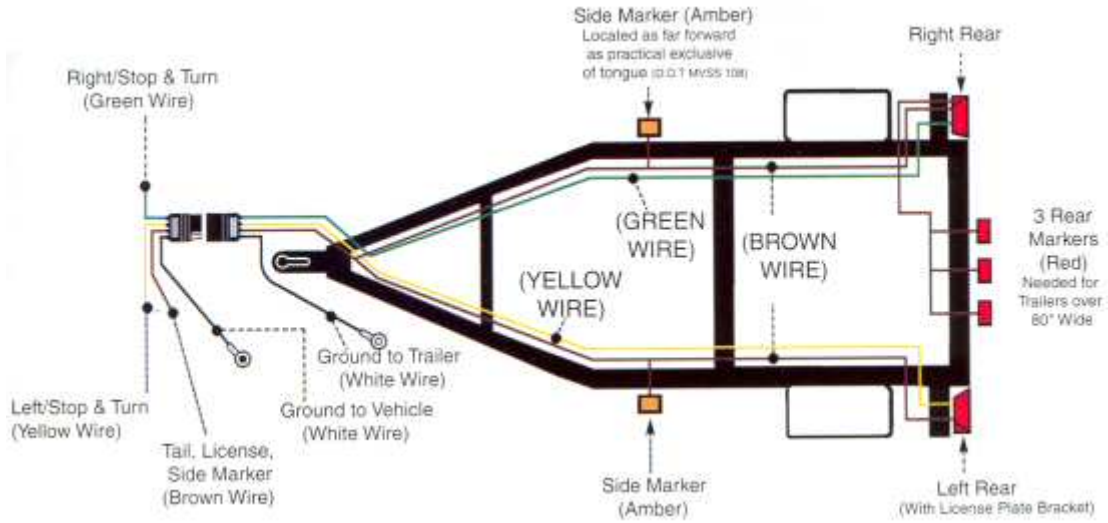
There seems to be no clear standard for VHS Video Cameras. Column "Name" is the most common function. Three alternative functions that could apply for some cameras are presented in columns named "Alt Name X".

Pin	Name	Alt Name 1	Alt Name 2	Alt Name 3
1	video out	video in/out		
2	video gnd			
3		serial data		
4		tally and clock	reset in	
5		audio out right	standby out	audio in
6	pause			
7	audio out	audio out left		
8	audio gnd			
9	power gnd			
10	+12V power			

# Trailer Wiring Diagrams

## 4 Way Systems

Flat molded connectors allow basic hookup for three lighting functions; **right** turn signal / stop light (green), **left** turn signal / stop light (yellow), taillight / license / side marker (brown) and a ground (white).



4 way tow vehicle side.



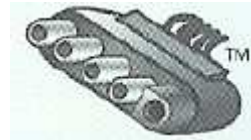
4 way trailer side.

## 5 Way Systems

Same as 4 way system listed above but adds a extra red or black auxiliary power wire.



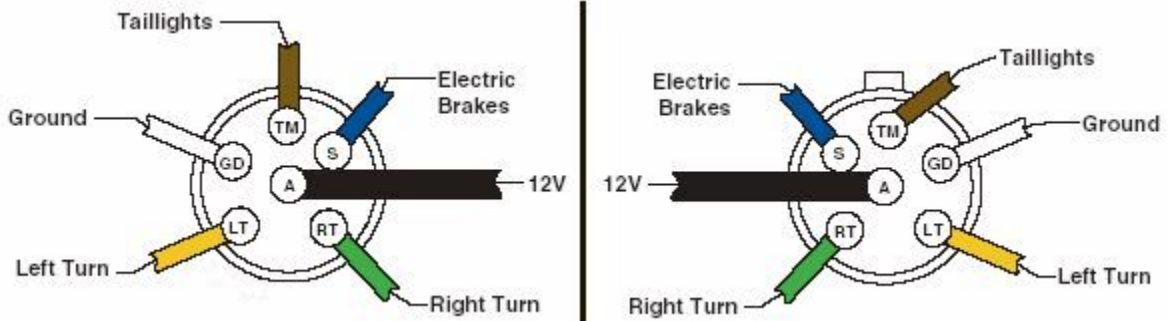
5 way tow vehicle side.



5 way trailer side.

## 6 Way Systems

Round 1 1/4" diameter metal connector allows 1 or 2 additional wiring and lighting functions such as back up lights, auxiliary 12v power or electric brakes. **Note:** The black (12v) and blue (electric brakes) may need to be reversed to suit the trailer. Check with a test light or VOM.



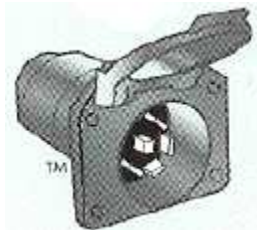
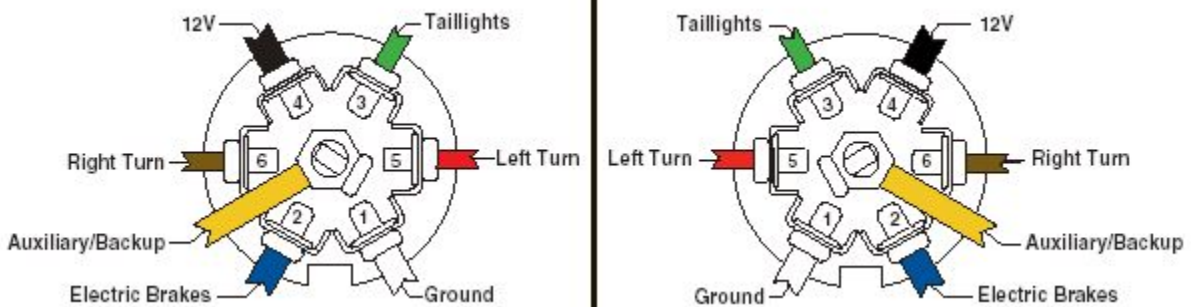
6 way tow vehicle side.



6 way trailer side.

## 7 Way Systems

Round 2" diameter connector allows additional pin for auxiliary 12v power or backup lights.



7 way RV flat blade tow vehicle side.

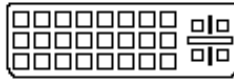


7 way RV flat blade trailer side.

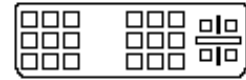
Common Computer Connectors (images are not to scale)



**HDMI**  
Digital Video and Audio



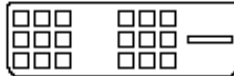
**DVI-I Dual Link**  
Digital or Analog Video



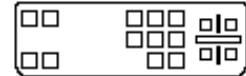
**DVI-I Single Link**  
Digital or Analog Video



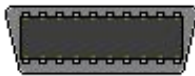
**DVI-D Dual Link**  
Digital Video



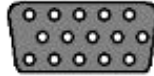
**DVI-D Single Link**  
Digital Video



**DVI-A**  
Analog Video



**DFP**



**VGA**



**External Power**



**HDI30**  
Apple's PowerBook



**Mini3**  
AppleTalk & LocalTalk



**Mini4**  
Apple's ADB Port for  
Mouse & Keyboard



**Din5**  
PC Keyboard & AppleIIc Serial



**Mini6**  
PS/2 Keyboard & Mouse



**Mini8**  
Image/Laser Writer & Serial Printers,  
HP DeskWriters



**Mini9**  
Bus Mouse








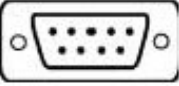
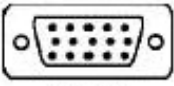
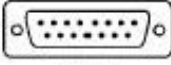
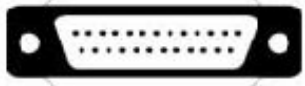
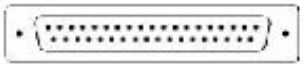
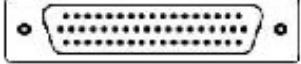




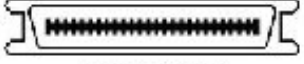


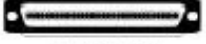
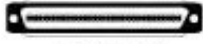
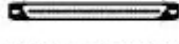



**BNC**  
Networking



**Twinax**  
Networking

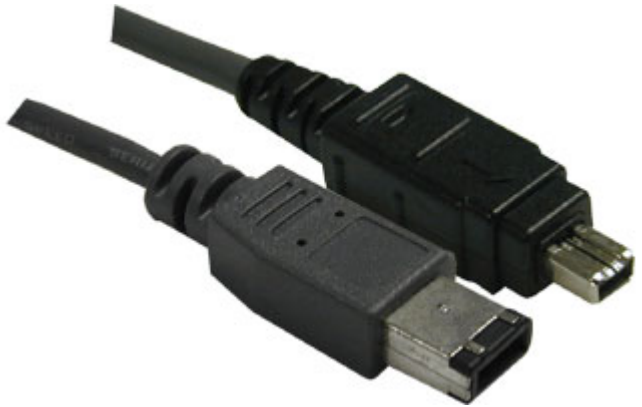


Common Computer Connectors (images are not to scale)

 <p><b>TNC</b> Networking</p>	 <p><b>F-Type Coax</b> Networking</p>	 <p><b>N-Type Coax</b> Networking</p>
 <p><b>RJ45</b> 8 Wires Network</p>	 <p><b>13W3</b> Sun Workstation</p>	 <p><b>DB9</b> Serial Mouse &amp; Printer, Mono Monitor</p>
 <p><b>HD15</b> VGA &amp; SVGA</p>	 <p><b>DB15</b> Joystick, AUI, Mac Video</p>	 <p><b>DB25</b> PC Serial or Parallel IEEE1284 Type A</p>
 <p><b>DB37</b> Serial, CD-Rom, Bernoulli Box</p>	 <p><b>DB50</b> SCSI I</p>	 <p><b>HPDB50</b> SCSI II</p>
 <p><b>HPDB68</b> SCSI III</p>	 <p><b>Centronic 24</b> IEEE488</p>	 <p><b>Centronic 36</b> Parallel &amp; IEEE1284 Type B</p>
 <p><b>Centronic 50</b> SCSI I</p>	 <p><b>HPCen36</b> IEEE1284 Parallel Type C</p>	 <p><b>HPCen50</b> SCSI &amp; Think Pad SCSI</p>
 <p><b>HPCen60</b> RS/6000 &amp; Think Pad SCSI</p>	 <p><b>HPCen68</b> RS/6000</p>	 <p><b>.8mm VHD Cen68</b> UltraSCSI</p>
 <p><b>IDC34 Edge Card</b> Internal 5.25 Floppy &amp; Tape</p>	 <p><b>IDC34 Socket</b> Internal 3.5 Floppy &amp; Tape</p>	 <p><b>IDC40 Socket</b> Internal IDE HD, CD ROM</p>



**Firewire - Six pin**



**Firewire 6 wire to 4 wire**



**Firewire - 4 wire**



**Firewire 800 - 9 wire**



**USB – Type A, Male**



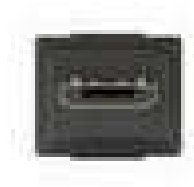
**USB – Mini B, Male 5 pin to Type A, Male**



**USB – Type A Male to Type A Female**



**USB – Micro A**



**USB – Micro B**



**USB – Micro A**



**USB – Micro 3 b**



**USB – Micro A**



**USB – Mini B**



**USB – Mini B 4 pin**



**SC Fiber (Duplex)**



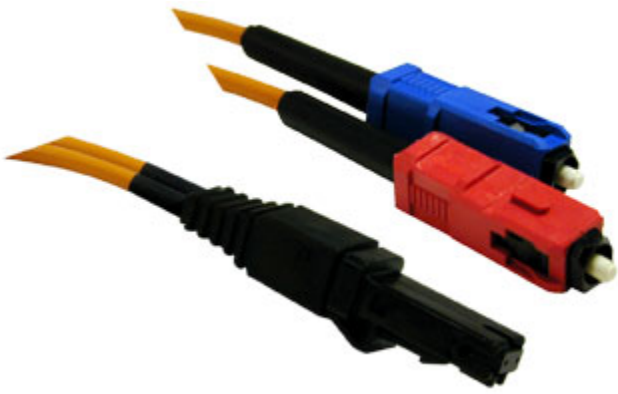
**ST Fiber**



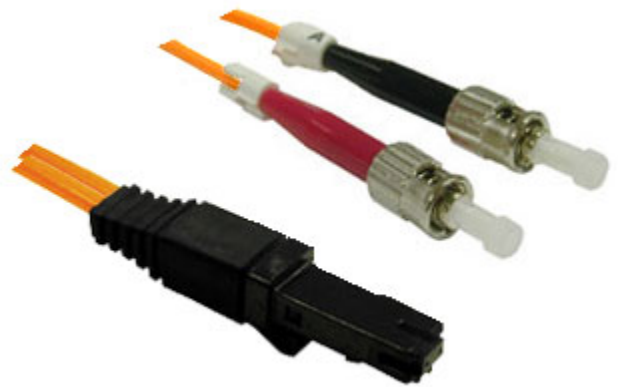
**LC Fiber (Duplex)**



**FC Fiber**



**MTRJ to SC**



**MTRJ to ST**

**Additional References**

Dash <http://www.dashdist.com>

Dalco <http://www.dalco.com>

Media College <http://www.mediacollege.com/>

Crown Audio <http://www.crownaudio.com/>

Automotive Accessories Connection: <http://www.accessconnect.com>