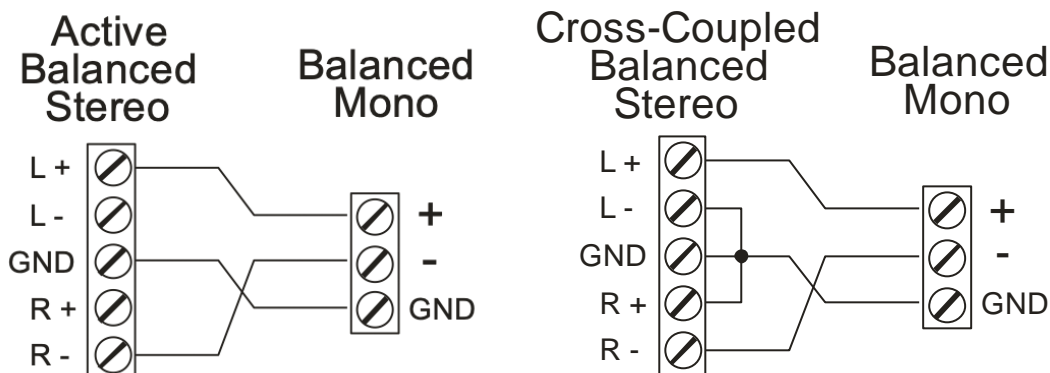## Balanced Stereo to Balanced Mono

Most balanced outputs use an active output design which is not equivalent to a transformer. These outputs typically have a 150 to 200 ohm resistor on the output of an op-amp. So if you connect outputs together (L+ R+ and L- R-) or connect and output to ground you will damage the op-amp over time. Some devices use a cross-coupled output design which simulates a transformer. When using cross-coupled type of outputs, always connect unused outputs to ground. You need to look at the device specifications to determine if they are active or cross-coupled.

Rane has a great article on output connections http://www.rane.com/note110.html
Another great RaneNote to checkout: http://www.rane.com/note140.html

These methods allow you to connect all of your input devices to a matrix switcher in stereo and convert the outputs to balanced mono without using a balanced mixer like the RDL STD.


Unbalanced Stereo to Balanced Mono

This is a problem that causes all types of audio problems in an installation. You have a VGA wall plate with an 3.5mm stereo connector and the audio system only has a balanced mono audio input. It is very common to find that the installer has connected the left (Tip) to the + input and the ring (Ring) to the − input. When this is done, you will find that the audio sounds very strange like Karaoke. This is because you just mixed the two inputs out of phase. A better method is to use a special audio transformer to convert the unbalanced stereo to balanced mono. ProCo Sound makes a 300 ohm 1:1 transformer called the LOT-1 that can solve your audio issues.

http://www.procosound.com/download/datasheets/LOT-1_specsheet_1006.pdf

Unbalanced Stereo to Balanced Mono
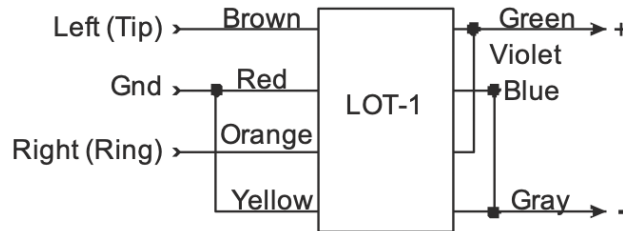
RS232

It is always a problem to determine how to correctly wire the RS232 control cables between the control system and the controlled device. You try to look up the proper wiring in the user's manual and it is usually wrong or misleading. Some people think this can be done by the sex of the connector, and if you do this you will probably be wrong about %40 of the time. One thing you should never use is a fully wired store bought RS232 cable. Control systems like AMX and Crestron use their DB 9 com ports for other applications like RS422 and RS485. I have seen control systems do very strange things when a fully wired cable is used.

A system I have found that works about every time is to find the device transmit wire at the control system. When connecting RS232 devices to a control system, first connect the device (Pins 2 (Red), 3 (Black) and 5 (Shield)). Before connection to the control system measure the voltage between the Red and Shield wires and the Black and Shield wires. The wire that has power on it, typically 6 volts, connect to pin 2 of the controller and connect the other wires to their respected other pins.

Adding Low Cost RS232 Ports to a Control System

Sometimes you just don't have enough serial ports and you either have to add expansion devices, cards or step up to the next level of controller. Another issue is having installer solder RS232 connectors. Many installers are finding it a lot easier to run Cat5 for their RS232 cables and use RJ45 to DB-9 adapters.

Connector	Pin	RS-232
RJ45	1	DSR
	2	RTS
	3	GND
	4	TxD
	5	RxD
	6	DCD
	7	CTS
	8	DTR
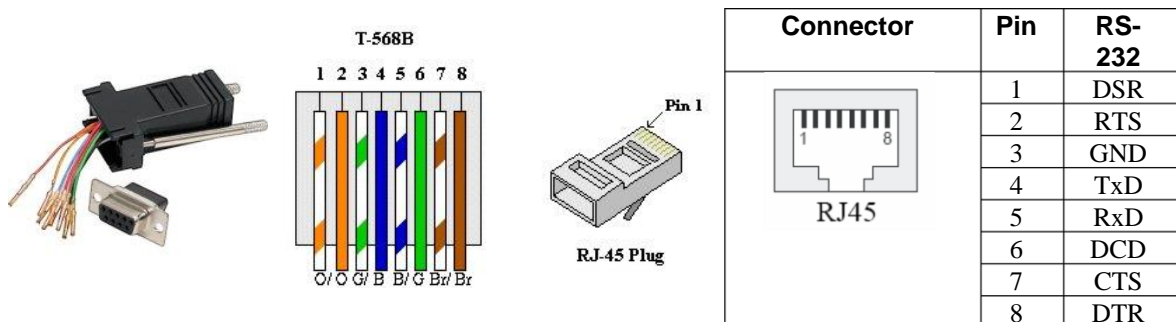
With the TEKVOX TekPort http://www.tekvox.com/downloads/DS-TekPort.pdf you can reduce your control system cost and simplify your installation. The TekPort basically adds 8 or 16 serial ports over a single LAN connection. Since the RS232 ports on the TekPort use RJ45 type connectors, the controller end of the serial connection can remain as RJ45 while the device end uses a RJ45 to DB-9 adapter.

Since the connection is already made to the controller, you will need to find the transmit pin on the device. The transmit pin on the device will have about 6 volts on it to ground. Using the connector from http://www.pccables.com/01910.htm connect Red to the RX, Green to TX and Black to Pin 5. All of the other wires should be isolated with tape or cut.

Combining Two RS232 Transmitters Together

You may come across a situation where you have two controllers and you need to control one device. For example; you have two Extron MediaLinks to operate two projectors and you need to control a video switcher. By adding this diode circuit you will be able to control a single device with two separate RS232 outputs. This method only works for one way serial communications.