



## Redundant Power Supplies

Many of Sierra Video Systems products use an approach to dual power supplies that is not common in the industry. This design note describes the power supply system and why you may not need dual supplies in as many applications as you may think.

All 3 and 4RU Sierra and Tahoe family routing switchers as well as our 3RU audio and video distribution amplifier frames, employ the type of supply described below.



All of Sierra Video Systems products are modular in design. Each plug-in circuit board and many of our control panels use individual linear voltage regulators to supply each DC voltage needed by the circuits on that module. This is a very common approach. The Sierra Video Systems design differs at the input to these regulators. Each module is powered by low voltage AC rather than the DC output of an off board power supply. Each module has two full wave bridge diode rectifiers and large filter capacitors. It is these components which, when built into a power supply that powers a large number of modules, are put under great stress and are prone to fail first. The rectifiers and large filter capacitors on individual modules are each under very little stress and have proven to be very reliable with no known field failure in the past 13 years.

The low voltage AC which powers each of the modules comes from a toroidal transformer that is an integral part of the frame. 50/60 Hz transformers are by their nature very high quality. We use toroidal transformers because they have higher power ratings and lower magnetic field radiation than conventional transformers, and their low profile fits nicely in our frames.

When dual supplies are ordered, a different frame is required. The dual supply frame has two AC input lines, two fuses, two power switches and two transformers. The two supplies do not connect to a common point in the frame. They are tied on each module after the full wave bridge and before the voltage regulators.

Dual power supplies should be used in critical applications where there are two separate AC lines. Each of these should come from a different circuit breaker or preferably from a different AC line phase. Each of the AC input transformer circuits is more dependable than the AC source that feeds it. The Sierra Video Systems dual power supply option should not be purchased to protect from a power supply component failing but rather as a means to connect the routing switcher to two different AC Lines.

Because the transformer is an integral part of the frame, there is no such thing as a "spare" power supply that you would be able to "plug-in" in anticipation of a failure.