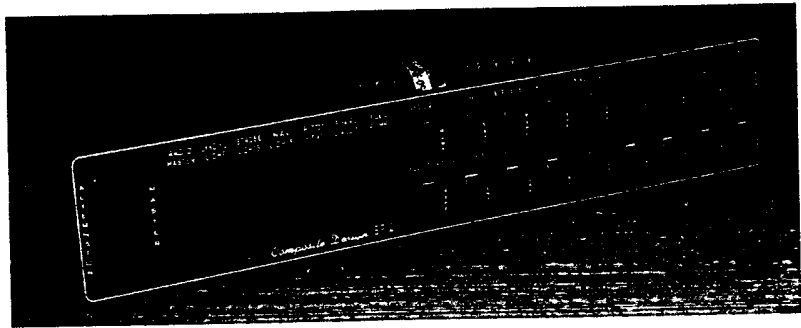


Composite Design



Standard Power Panel SP-2

www.CompositeDesignInc.com

The Composite Design "Standard" Panel is a self contained power distribution assembly which includes the most commonly used switches & circuit breakers. It is based on a very heavy duty printed circuit board that replaces all buss bars and terminal wiring.

There are several buss circuits used in this design:

- 1- The Main Buss is powered from the switched battery circuit – typically the output of the master solenoid.
- 2- The switched Radio Buss is powered the same as main buss but can be switched for avionics shut down. This buss also employs a filter circuit that attenuates noise & spikes on the avionics power supply.
- 3- There is an Essential Buss which is meant is to power the "Glass" used in modern aircraft with a degree power supply flexibility. The essentials can be powered directly by the Main buss or from a back up power management system such as the Composite Design "Power Guard".

Switches are rated 15A/28VDC, the relay used on the radio sub buss is rated 25A/28VDC. The circuit breakers are a thermal resettable type (non-pullable).

Power & Ground are connected to the panel via 1/4" ring terminals from the master solenoid and battery negative. The PC mounted terminal blocks connect the accessory circuits and respective grounds using #6 ring terminals.

The face plate artwork is a Lexan overlay that is durable & scratch resistant. NEVER use solvents or abrasives to clean the overlay, gentle cleaning with alcohol is recommended. Mount the panel with #6 screws & plastic washers, Do Not Countersink or over tighten the screws! The breakers are reset-able but NOT designed to be "pulled off". Doing so will destroy the circuit breaker and void the warranty.

Switches and control functions:

- Radio Master (controls the avionics buss)
- Fuel Pump
- Nav Lites
- Strobe Lites
- Landing Lite
- Pitot Heat
- Spare Circuit Control
- Split Master Switch (Master and Alternator)

System Circuit Breakers:

Main Buss:

Landing Light, Nav Lights, Strobes, Fuel Pump, Pitot Heat, Engine Accessories, Trim/AP, Spare

Radio Buss:

Radio 1, Radio 2, Xponder, GPS, Audio, Av Spare

Essential Buss:

Display #1, Display #2, Engine Data, Flight Inst

Absolute Maximum Ratings:

- Panel buss = 80A (Continuous, includes radio bus)
- Radio buss = 25 A (Continuous)
- Essential buss = 10A (Continuous)
- Panel working voltage = 17.5 Volts

Panel dimensions:

2.25"H x 13.00"W x ~7.75"D (wt ~2.25 pounds)

This system can be ordered for 28 volt operation. Contact the factory for details and information.

Proper wiring techniques and tool selection is beyond the scope of this manual. We encourage the installer to have a working knowledge and appropriate tools prior to wiring our products or any other systems in an aircraft.

When routing the wires to the power panel, always allow an extra 8-9 inches of service loop in the cabling. This will allow easy removal of the panel without disconnecting the wiring. The panel can be easily slid out for full access...

Use only "ring" terminals for connections to the panel. A bare wire under the screw or "fork" terminals are not approved. When bolting the large wires in place for the primary power and ground, we recommend using only brass nuts & bolts. If the aircraft will be exposed to a corrosive environment, as in salty coastal areas, a light film of a conductive grease such as "Noalox" should be applied to all mechanical connections. Look for this product at any electrical supplier or Home Depot.

A decent, Ratchet type crimp tool will set you back \$50-\$100. Water pliers, channel locks, etc... are not acceptable crimp tools! Buy or borrow the right tool for the job. The object of a good crimp is not just mechanical strength but proper wire displacement in the crimp for a good electrical interface. Soldering the wires after crimping can lead to wire failure as the wires will lose flexibility at the terminal. With time and vibration the small strands will work harden & eventually fail.

When routing wires, make 90 degree runs instead of direct straight lines which will lead to a rats nest of tangled wires. Use wire ties every 6-8 inches or more where you have wires break out of the cable bundles.

Use only Mil spec 22759 type wire and PDIG crimp terminals. All is available from Aircraft Spruce and other suppliers.

Mount the panel using four #6-32 screws and plastic washers. Screws larger than #6 and metal lock washers are not necessary. If the wire bundle going to the back of the power panel is heavy, secure and support the wires. This will take the mechanical load off of the panel and the wire terminations, eliminating mechanical stress.

The wire gauge can be determined by the small chart found on the airframe wiring diagram (Page 6). As many loads are not continuous, use the recommended gauge. Oversized wiring will just add weight - more is not better.

Should it be necessary to change a circuit breaker, note the following - First remove the 1/4" connectors by gently slipping them off the back of the breaker. Next, using a pair of needle nosed pliers, compress the tangs on the sides of the breakers & push it out the front of the panel. To reinstall a breaker simply push it back in to place and wiggle the back side to left and right until you hear the pawls click into place. Reconnect the wires...

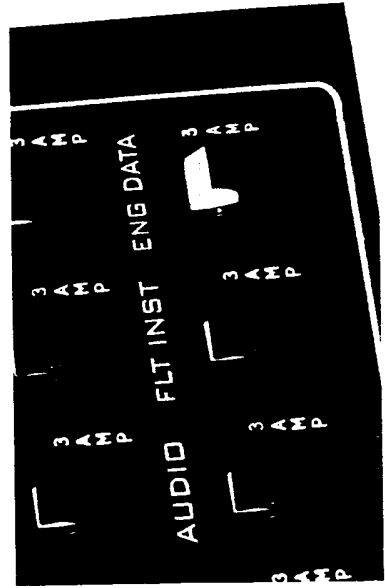
Replacement of a switch is much the same except that the retaining pawls are top and bottom.

When bolting on the +12V and Ground wires to the PCB, make sure that any lock washers are not in contact with the surface of the metal on the Printed Circuit Board. The washers will bite into the surface and cause damage.

The panel has specific circuitry to support an electrical back up system for the essential buss. The use of a back up is not required but is provided for. Contact Composite Design for technical information or visit our web site for additional, useful products such as the Power Guard or Trim Relay Boards. They are all proven components that offer reliable, long term service and simplify installation.

Power Panel Operation and Installation Notes:

The circuit breakers used in the assembly are thermal resettable devices that are not designed to be manually pulled (to an Off state). They can be reset if they do trip by simply pushing the button on the breaker. The picture below shows several breakers, the one in the lower right corner has been tripped to illustrate this condition.

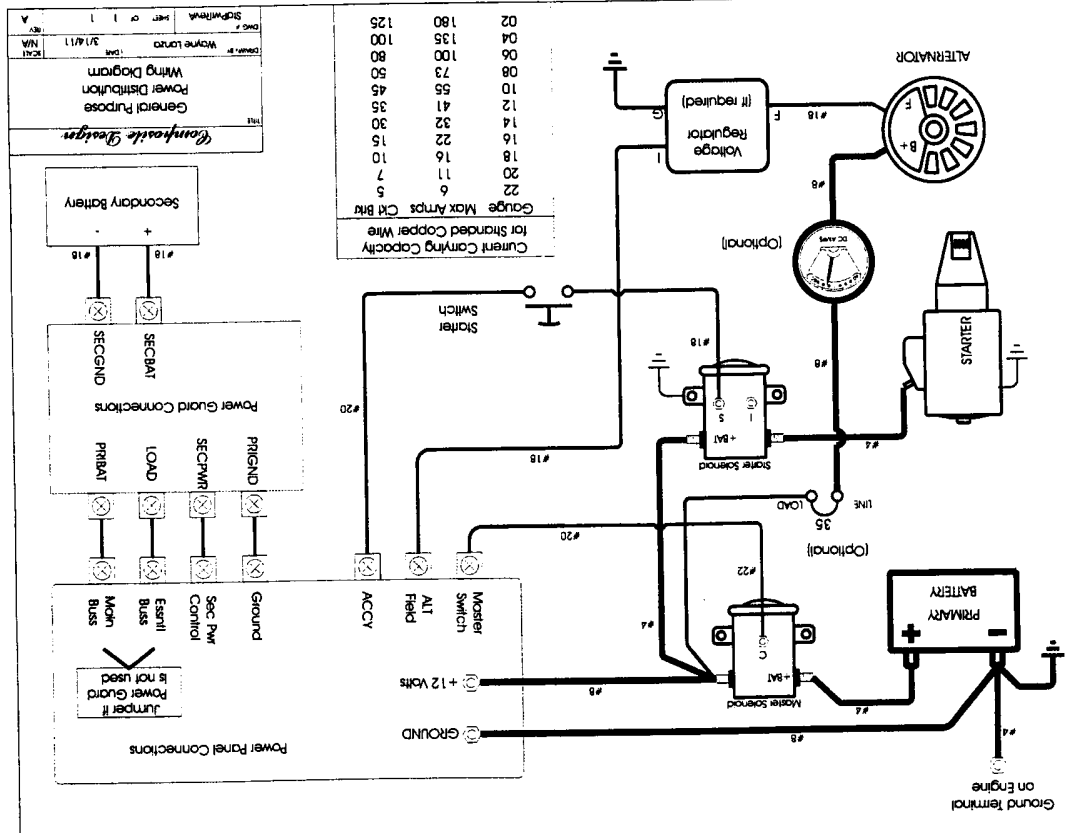


A common question is "There is still voltage on the buss after I turned power off". This voltage is a residual charge on C1 & C2. Discharge by applying a light load such as a test lamp or 100 ohm resistor from Ground to "+12V".

The Radio Master Relay uses the Normally Closed contact to supply avionics power. This means that the Radio Buss is powered off by turning ON the relay thus OPENING the N.C. contact. This is a common method that affords a degree of fail safe should the relay coil circuit fail or if voltage drops below the relay hold level.

If wired per instructions, the circuitry in this power panel will not engage the master solenoid if there is a reverse polarity condition such as "swapped" battery leads.

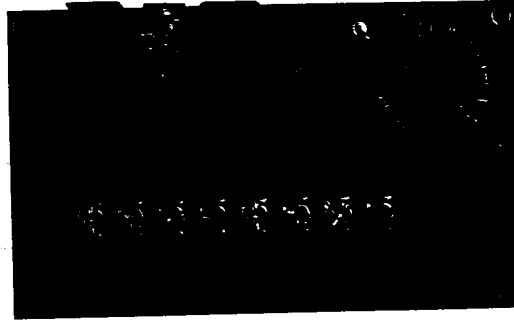
Recommended General Airframe Wiring Diagram



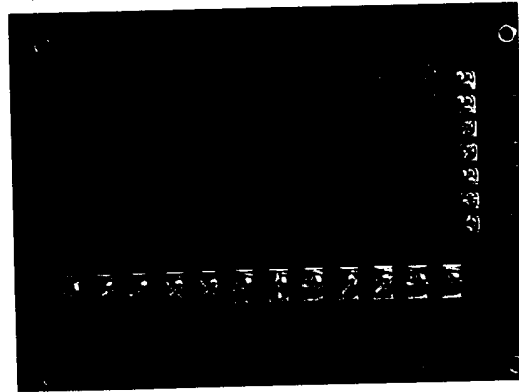
Visit the Composite Design web page for
Information on all aircraft electrical products.

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Power Guard Module

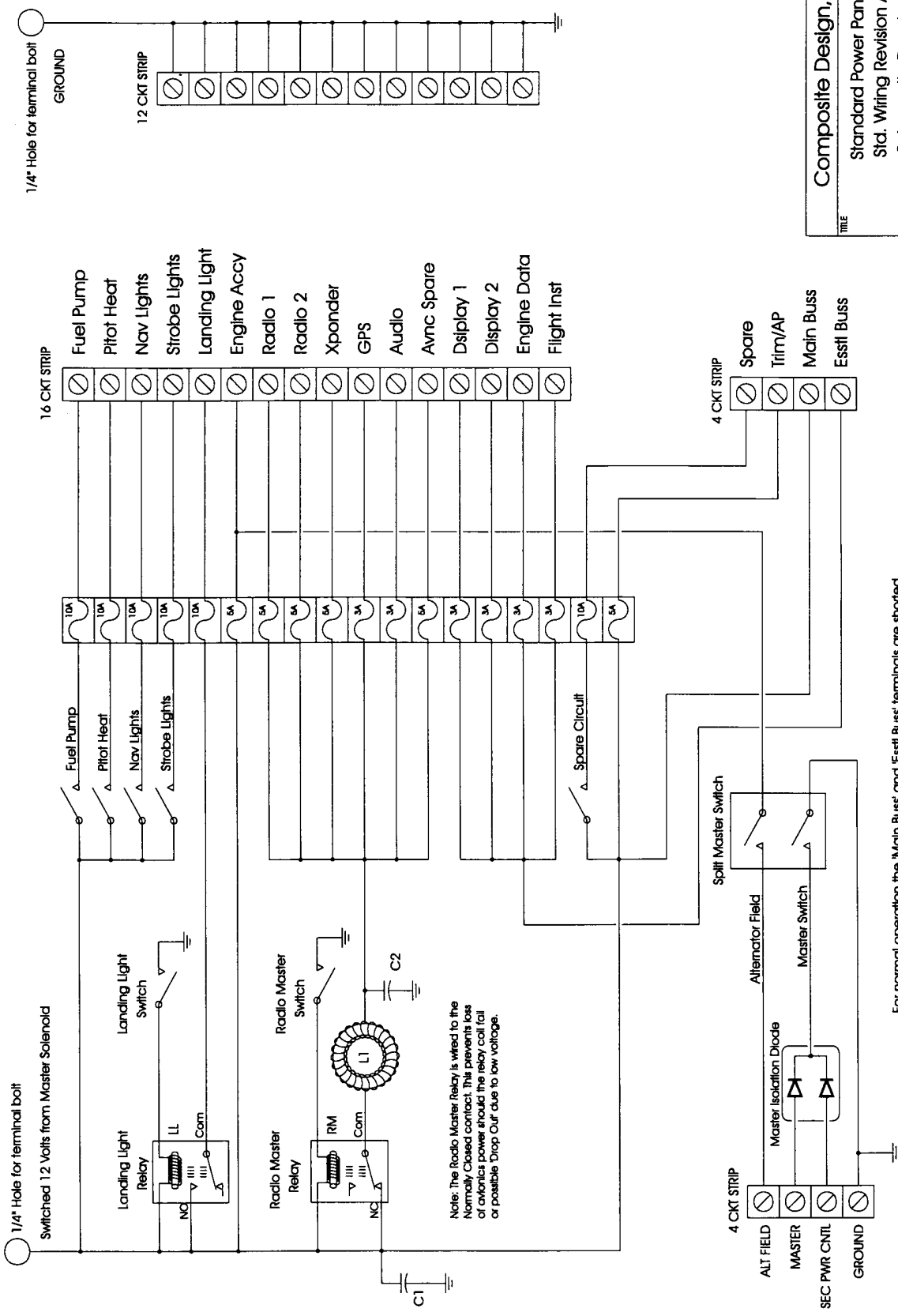


3 Axis Trim Relay Board



For sales and service contact:

**Composite Design, Inc.
3980 Miller Lane
Malabar, FL 32950
321 956 6619 (Voice & Fax)**



1/4" Hole for terminal bolt

Switched 12 Volts from Master Solenoid

1/4" Hole for terminal bolt

Composite Design, Inc.			
Standard Power Panel Std. Wiring Revision A Schematic Drawing			
DRAWN BY	DATE	SCALE	REV
Wayne Lanza	3/14/11	N/A	
DWG #	SHEET	OF	
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For normal operation the 'Main Buss' and 'Essst Buss' terminals are shorted. If a back up is required for the 'Essst Buss', a suitable system such as the Composite Design 'Power Guard Module' is installed between these two terminals to stabilize the essential buss voltage.