

Manual for Larken Controller

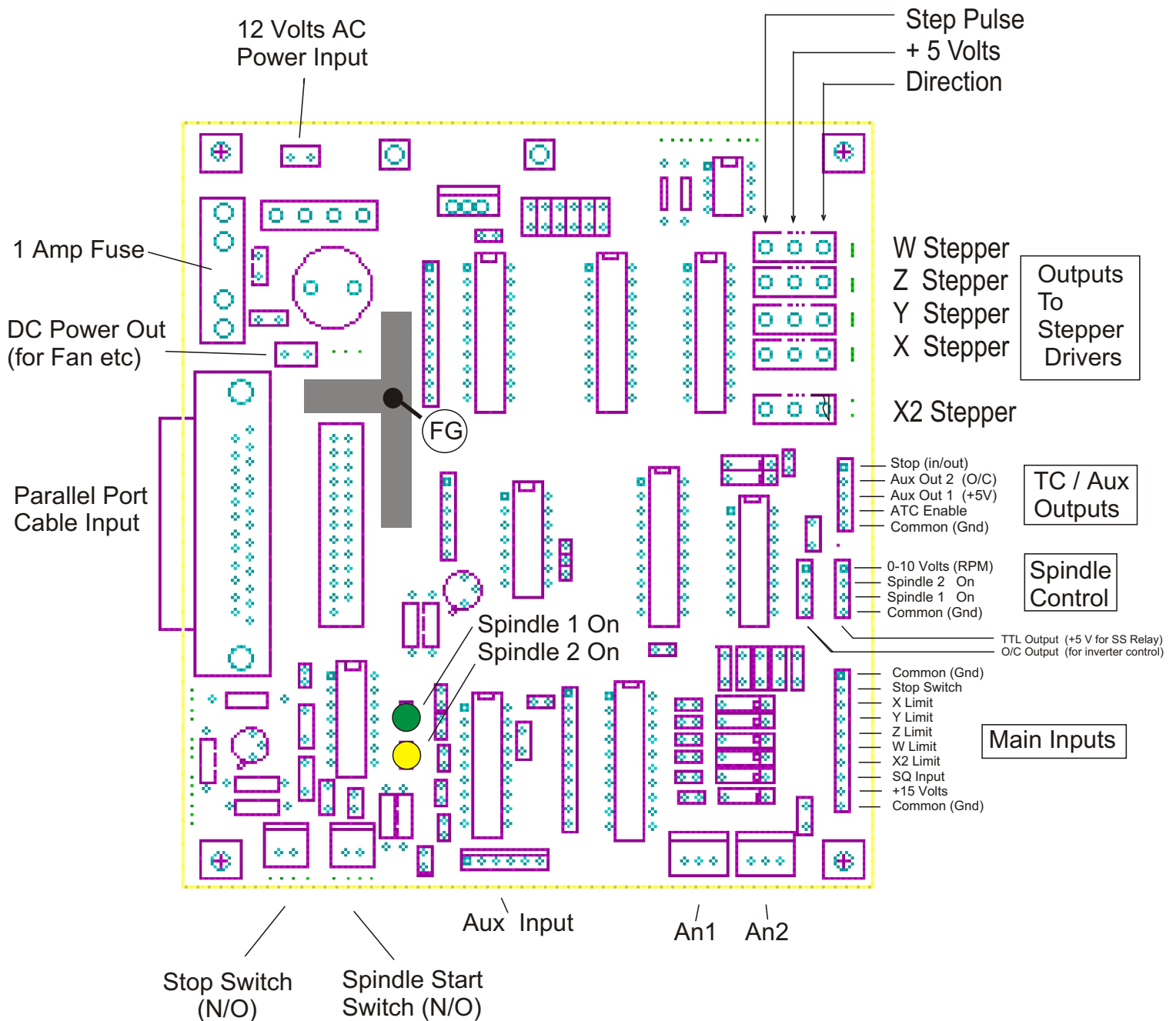
The Larken 3 axis stepper motor controller contains, the following sections.

- 16 Gauge case with connectors, Stop button and powerswitch and fuse etc.
- Powersupply, usually 45 or 65 volts DC at 300 or 500 watts
- PC Interface for Lcam Dos controller or (and) StarCam windows controller board.
- Stepper motor driver boards (3 or 4).

SAFTEY PRECAUTIONS

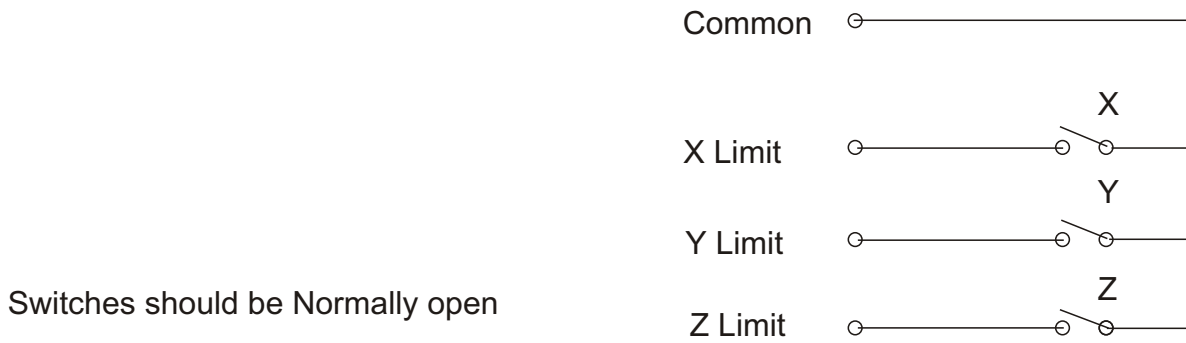
- Always unplug the power cord before doing any maintenance or opening the controller.
- Always use a 3 prong grounded soldering iron.
- High power components such as capacitors and pwer transisters can **explode**, always wear saftey glasses.

Larken Lcam Interface board Connection diagram



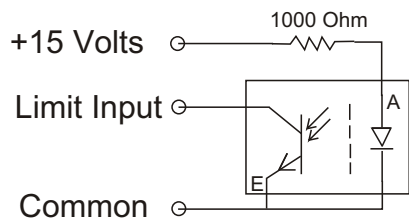
Connecting Limit switches to the Larken Interface board

Using Micro Switches for home/overtravel switch

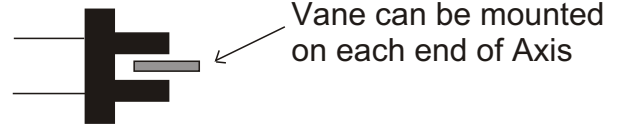


Note : The 'Limit SW polarity' setting should be set to 0 for Normally Open in Lcam

Using an Opto Switch for home/overtravel switch



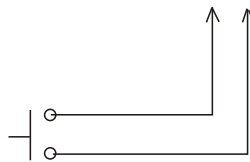
Opto Interrupter Module



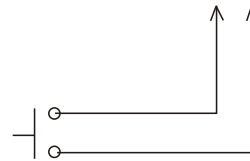
Digi-key PN / H21B1QT-ND
(Darlington output)

Note : NC limits are not available on the StarCNC controller at time of writing

Emergency Stop and Spindle Start Buttons



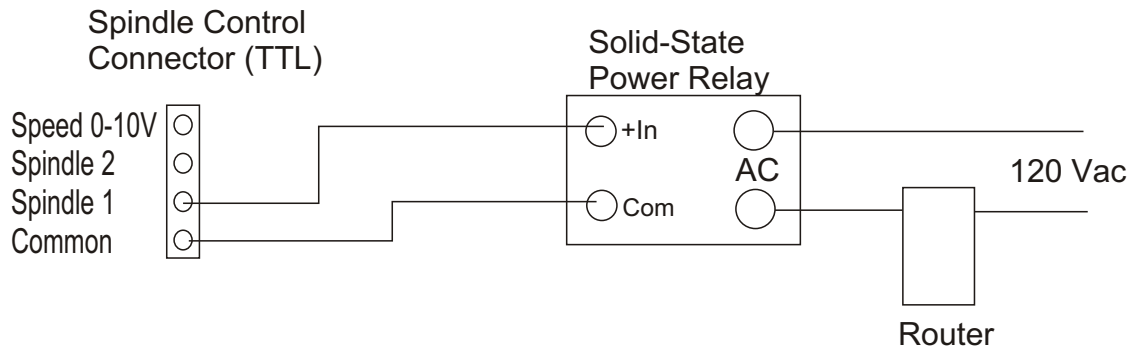
Emergency Stop



Spindle Start

Both use N/O (normally open) push button switches

Spindle Control

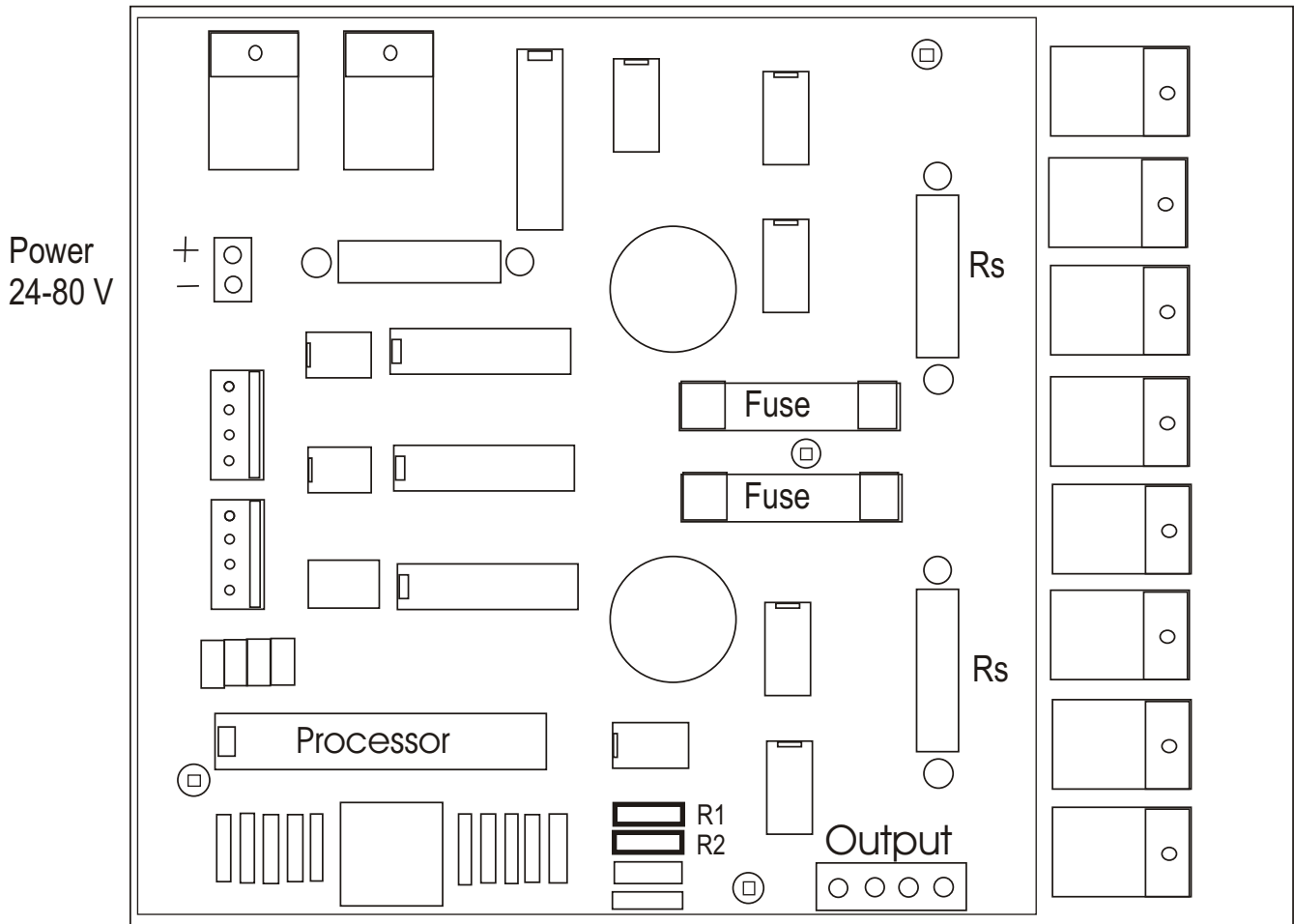


Use the TTL spindle control connector to drive CD controlled relays
Use the O/C (open collector) connector to drive most AC inverter drives.
The 0-10 volt speed output can control the Router RPM. The speed can be set in the Tool list within Lcam. It is output when running certain tool change modes.

Notes:

- The required power input to the Interface is 12 volt AC at 1 amp.
- There is a fan output to drive a small 12 volt DC fan for your controller
- Use a 1 amp fuse (radioshack)
- Do not connect the common ground to the frame on your machine. This may cause high currents to flow through the interface board.
- Keep all Limit switch and control wires isolated from machine ground
- Keep motor power wires separate from interface wires (limit etc)
- On controls where electrical noise is a problem, solder a ground wire on the interface to the FG point and connect it to the case of your controller

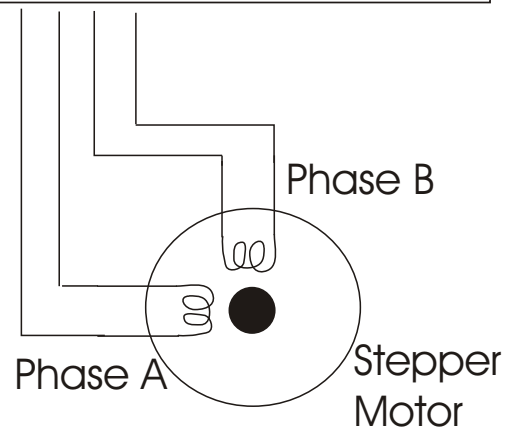
Cobra Stepper-Motor Driver Setup diagram



Setting the Current per phase

- Current is set by the value of R1 and R2.
- Both R1 and R2 should be the same.
- (Rs may be 0.1 or 0.05 ohms on your Cobra Please choose accordingly)

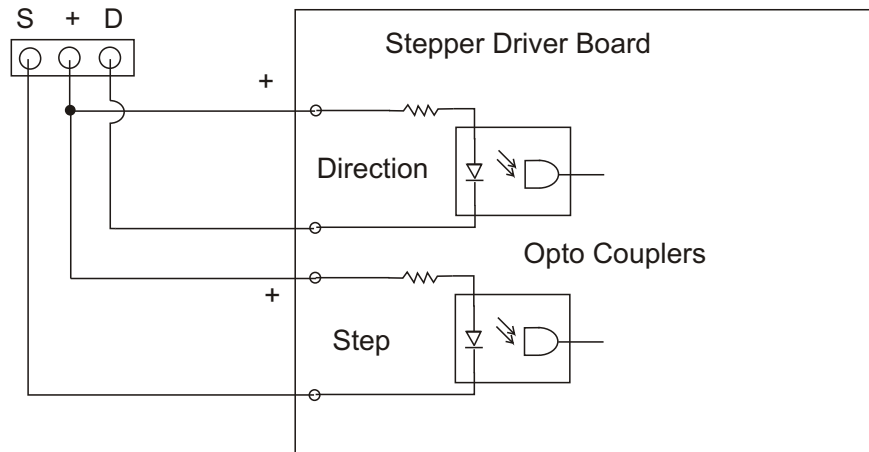
Current	RS=0.1	RS=0.05
8 Amp		4.2K
7 Amp		3.6K
6 Amp		3.0K
5 Amp		2.5K
4 Amp	4.0K	2.0K
3 Amp	3.0K	
2 Amp	2.0K	
1 Amp	1.0K	



- Reversing the connections on one phase will reverse motor direction

Cobra drive connections and Signals

Connecting Step/Direction Output to a Stepper motor driver board

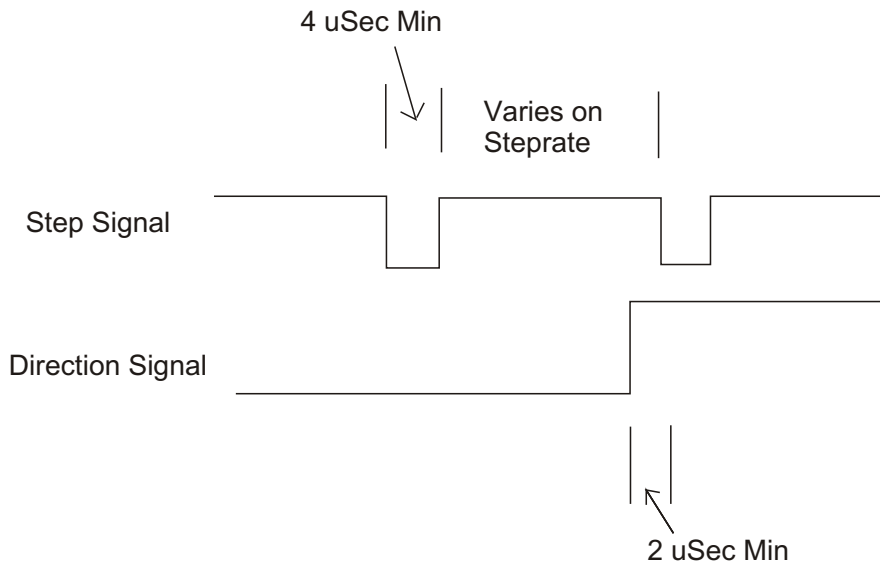


Some Stepper drivers have both + inputs connected internally

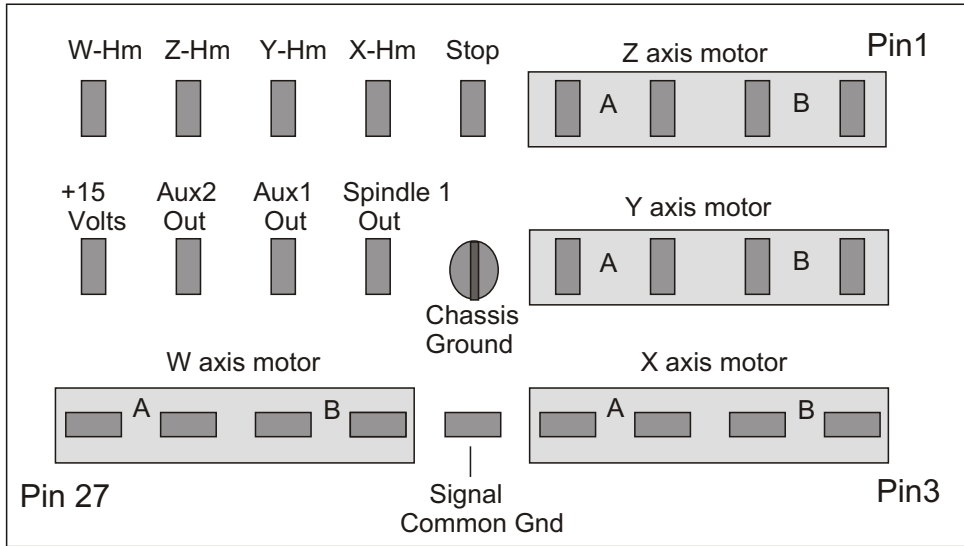
Output drive is from a 74HC573 chip.

Step and Direction waveforms created by Lcam software.

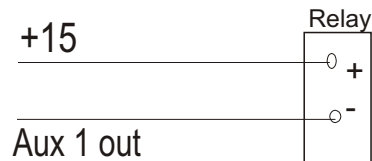
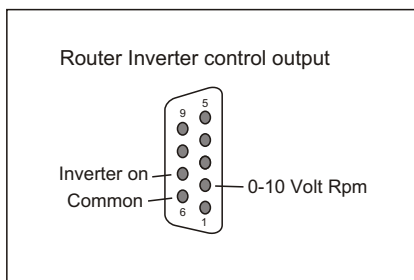
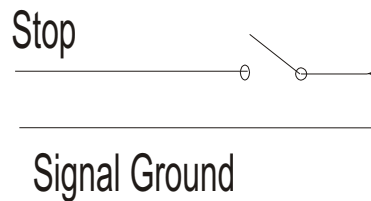
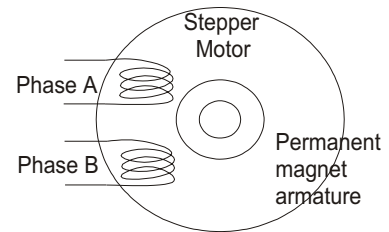
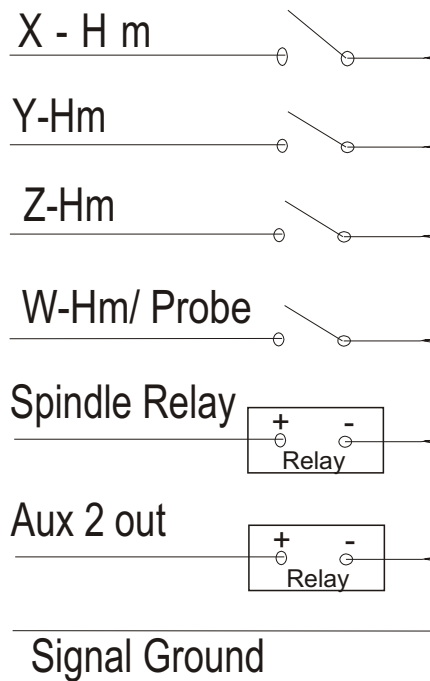
Step signal is normally high and pulses Low then high on each step



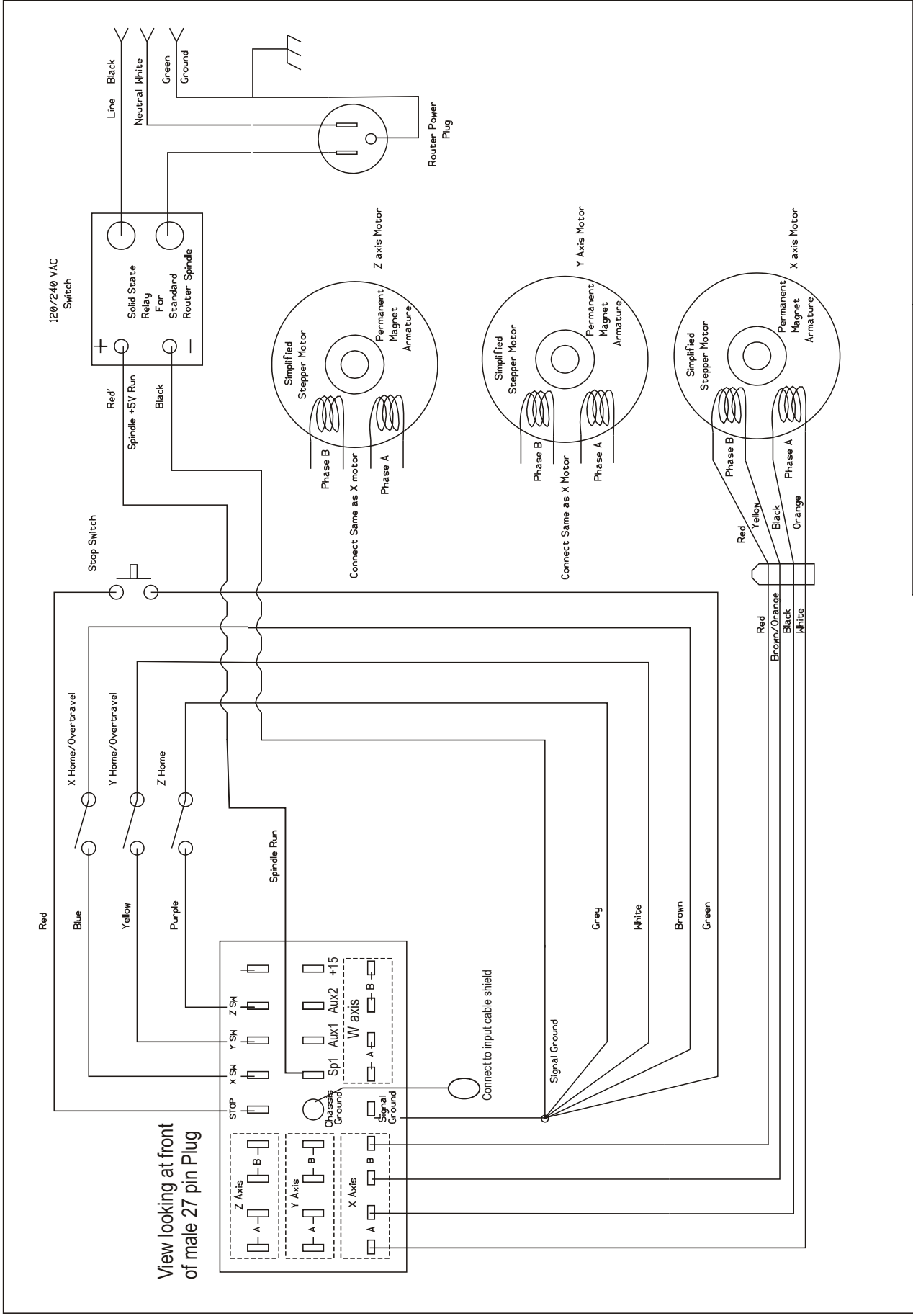
Larken Controller Rear Connectors



Female 27 pin Cinch connector looking at back of controller (from outside)



Note: Spindle 1 out and Aux2 out can supply 20ma (max) to external relay
 - Aux1 can sink 50ma (max) from the +15V supply



View looking at front of male 27 pin Plug

Installation and Wiring notes:

- Use Separate (18 gauge) 4 conductor cables for each stepper motor.
- Keep home/limit wires in a separate shielded cable.
- Chassis ground is connected to controller case inside of case
- Connect shields on input cables to chassis ground.
- Do not connect stepper motor wire shield to chassis ground. You may ground these shields to machine frame if necessary
- Do not connect controller Chassis ground or any controller wire to machine frame.
- Spindle power ground wire should be connected to machine frame.

- Signal ground comes from interface board and is common to all inputs.

- Do not short any motor output wires to each other or ground or driver damage will occur
- Connect one motor axis at a time and test before continuing. If motor runs wrong direction switch wires on one phase.
- Be sure to turn off controller for at least 30 seconds to allow main capacitor to discharge

- The spindle control on the 27 pin plug is for driving solid-state relays
- The 9 Pin D connector is for driving a Perske type router running from an variable frequency inverter drive
- The "AC-Tech" inverter is the one we recommend

