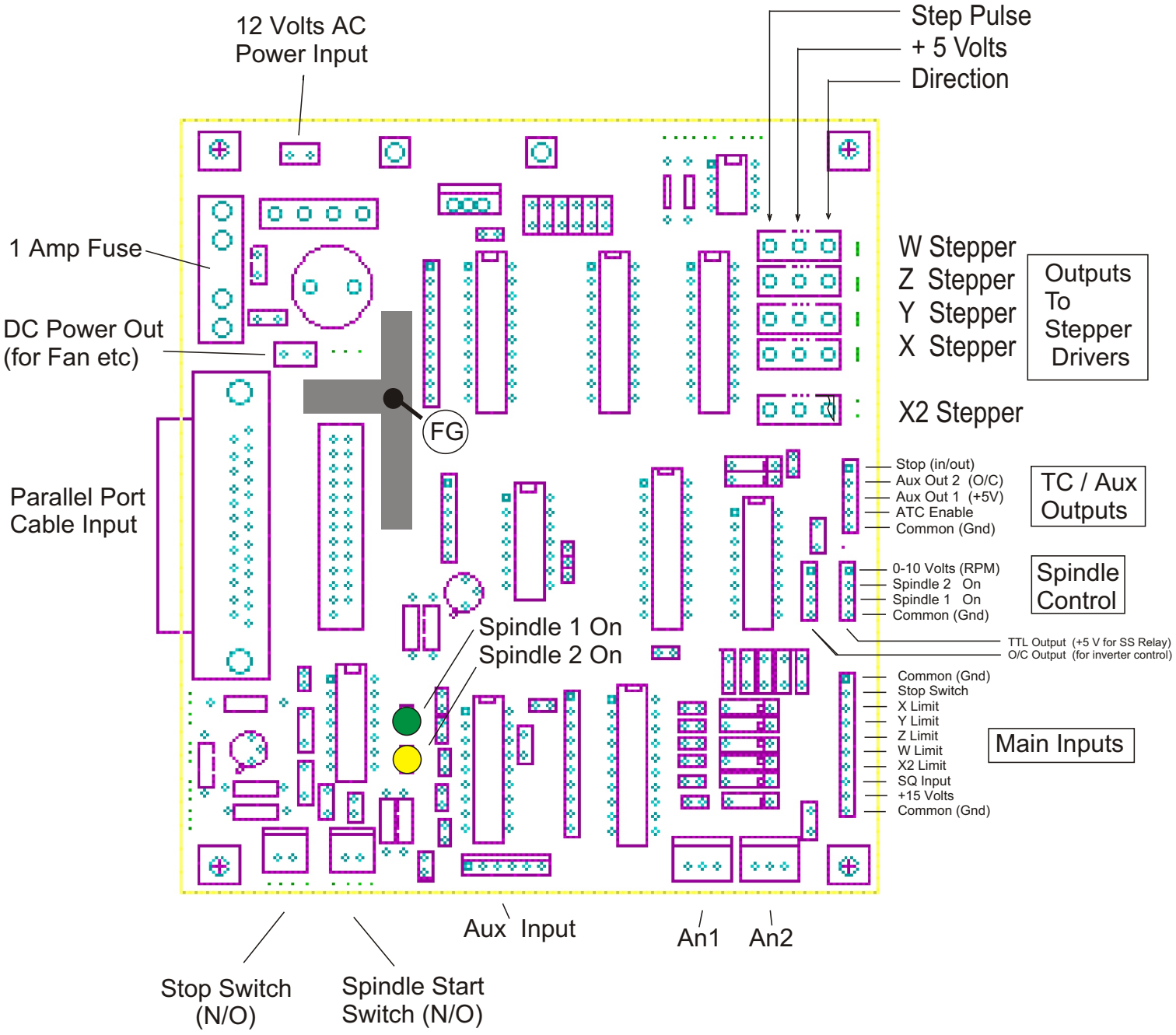
Manual for Larken Controller

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



LARKEN AUTOMATION

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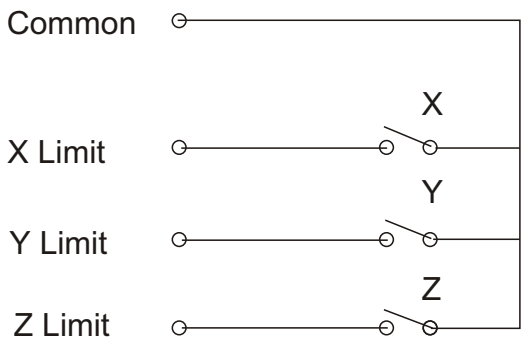
Ottawa, Ontario, Canada, K1J-9E1
(613)-746-5970 Fax(613)-746-6451
www.LarkenCNC.com

Connecting Limit switches to the Larken Interface board

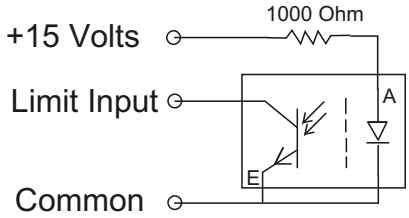
Using Micro Switches for home/overtravel switch



Switches should be Normally open

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

Using an Opto Switch for home/overtravel switch



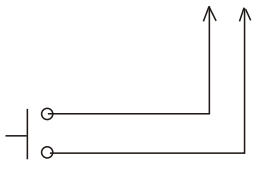
Opto Interrupter Module

Vane can be mounted on each end of Axis

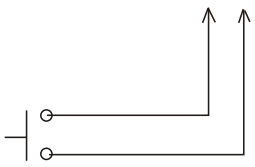
Digi-key PN / H21B1QT-ND
(Darlington output)

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

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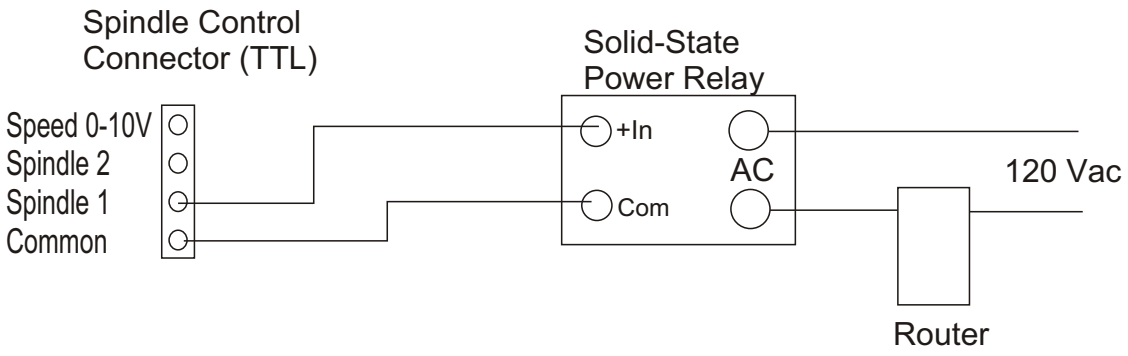
Spindle Control



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 ouput 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

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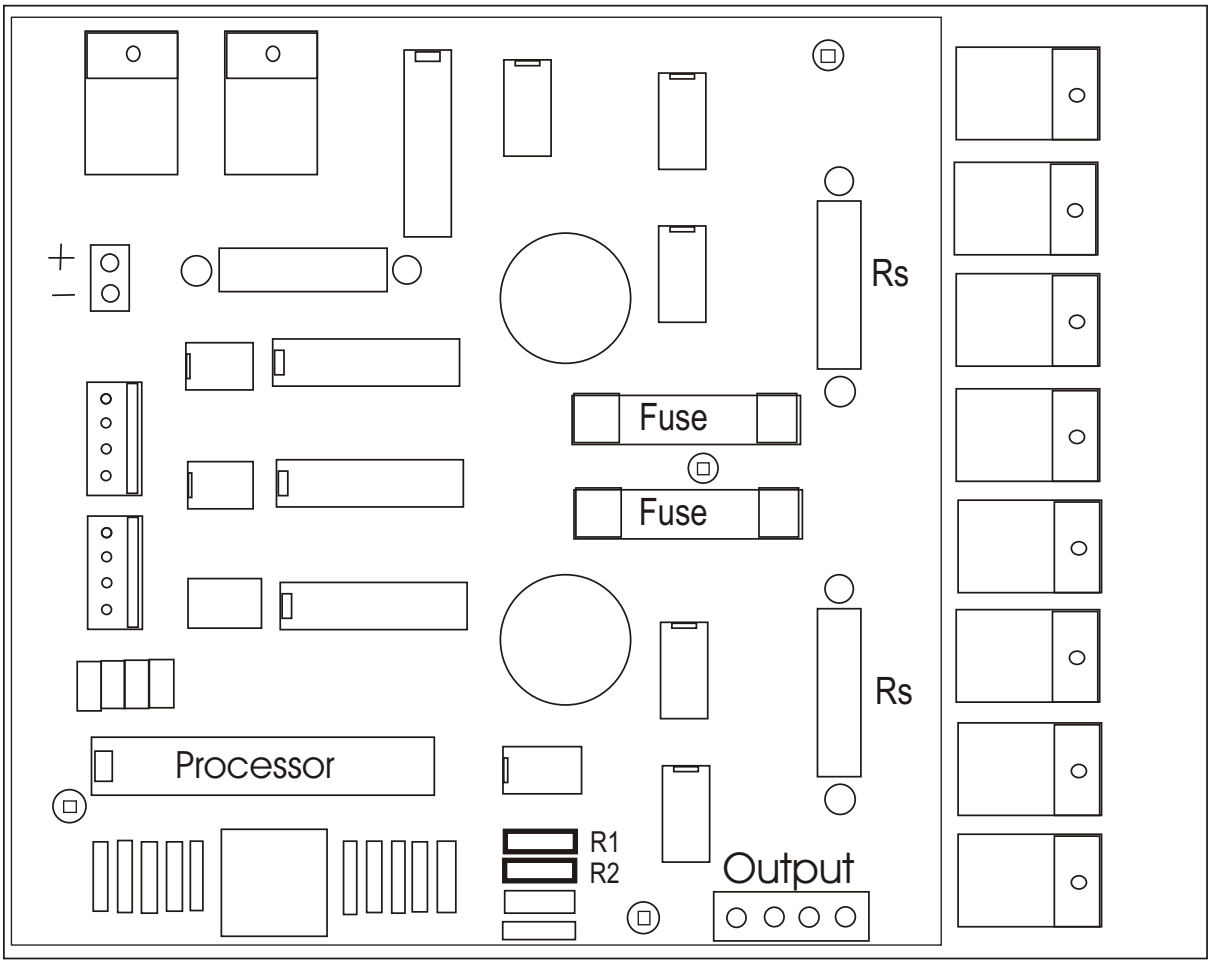
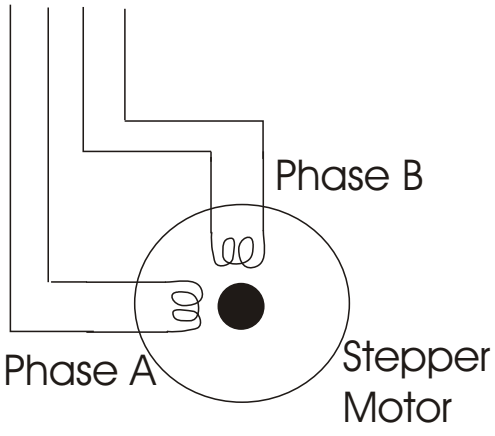
Cobra Stepper-Motor Driver Setup diagram



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

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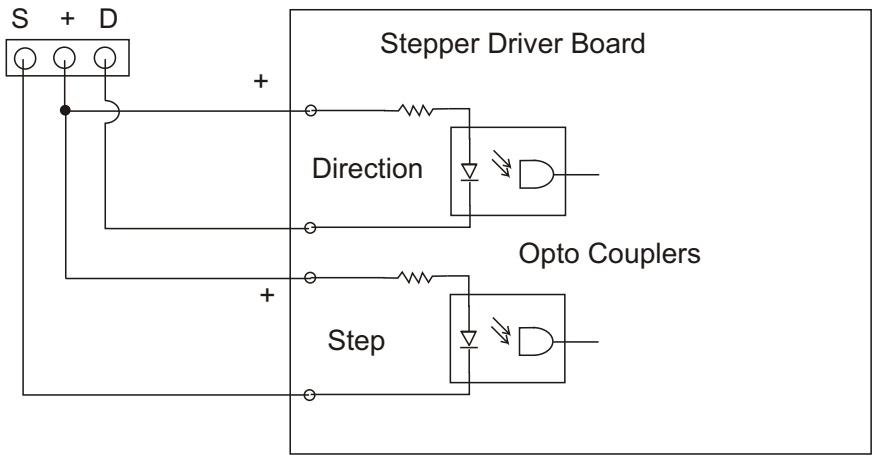
Cobra drive connections and Signals

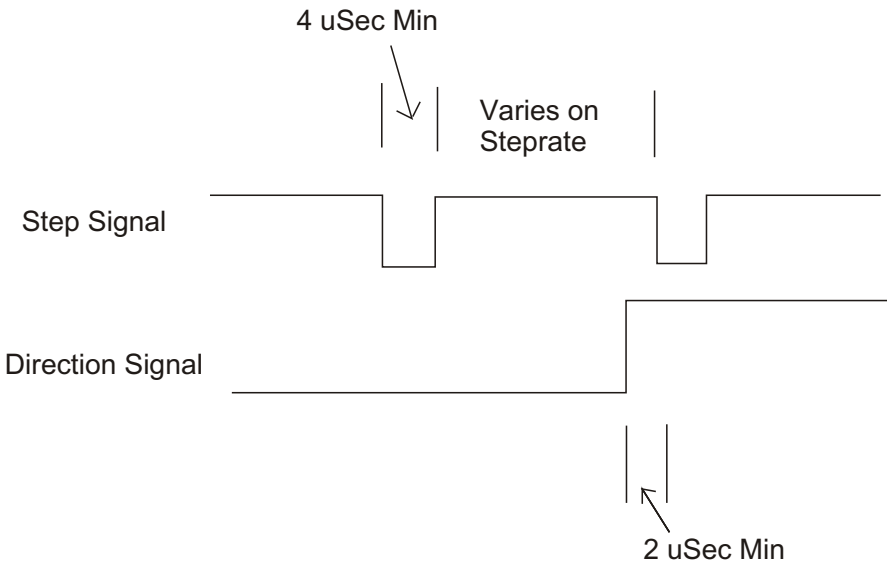
Connecting Step/Direction Output to a Stepper motor driver board



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



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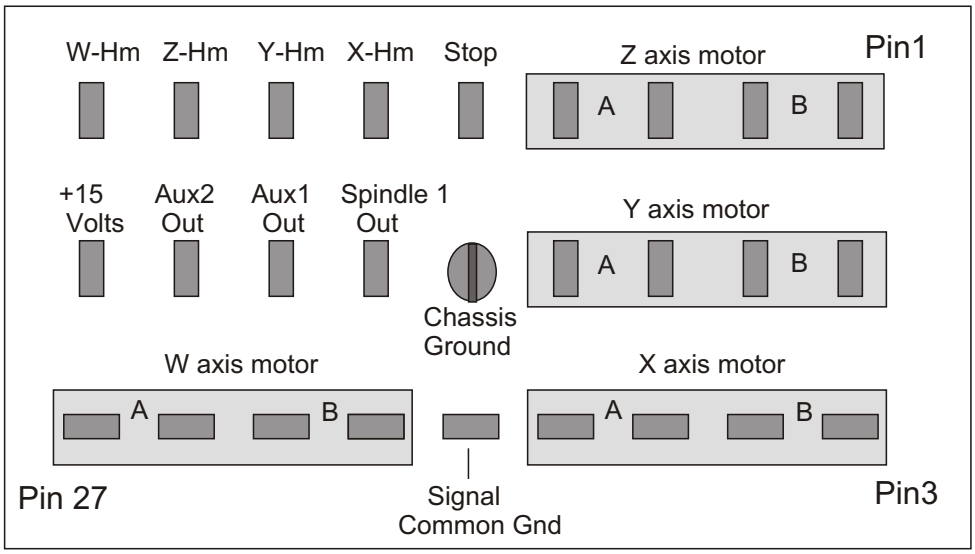
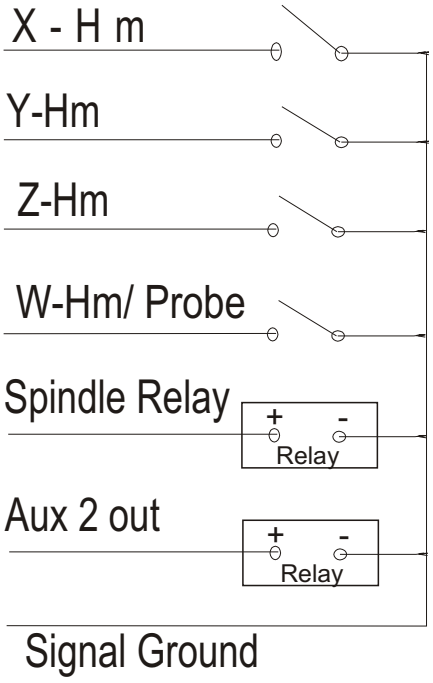
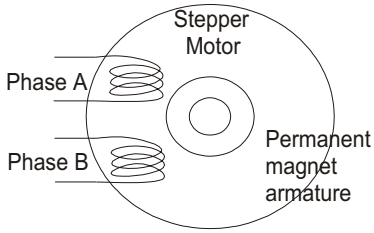
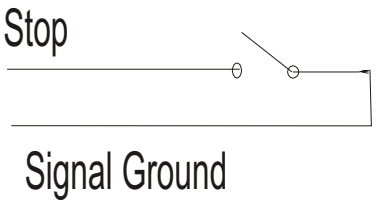
Larken Controller Rear Connectors

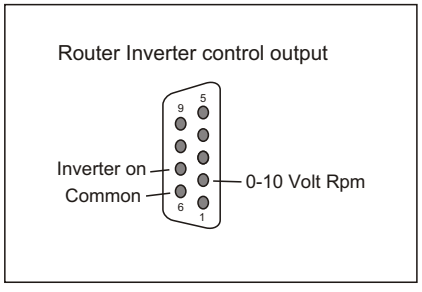


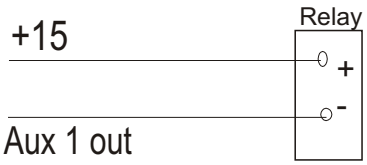
Female 27 pin Cinch connector looking at back of controller (from outside)



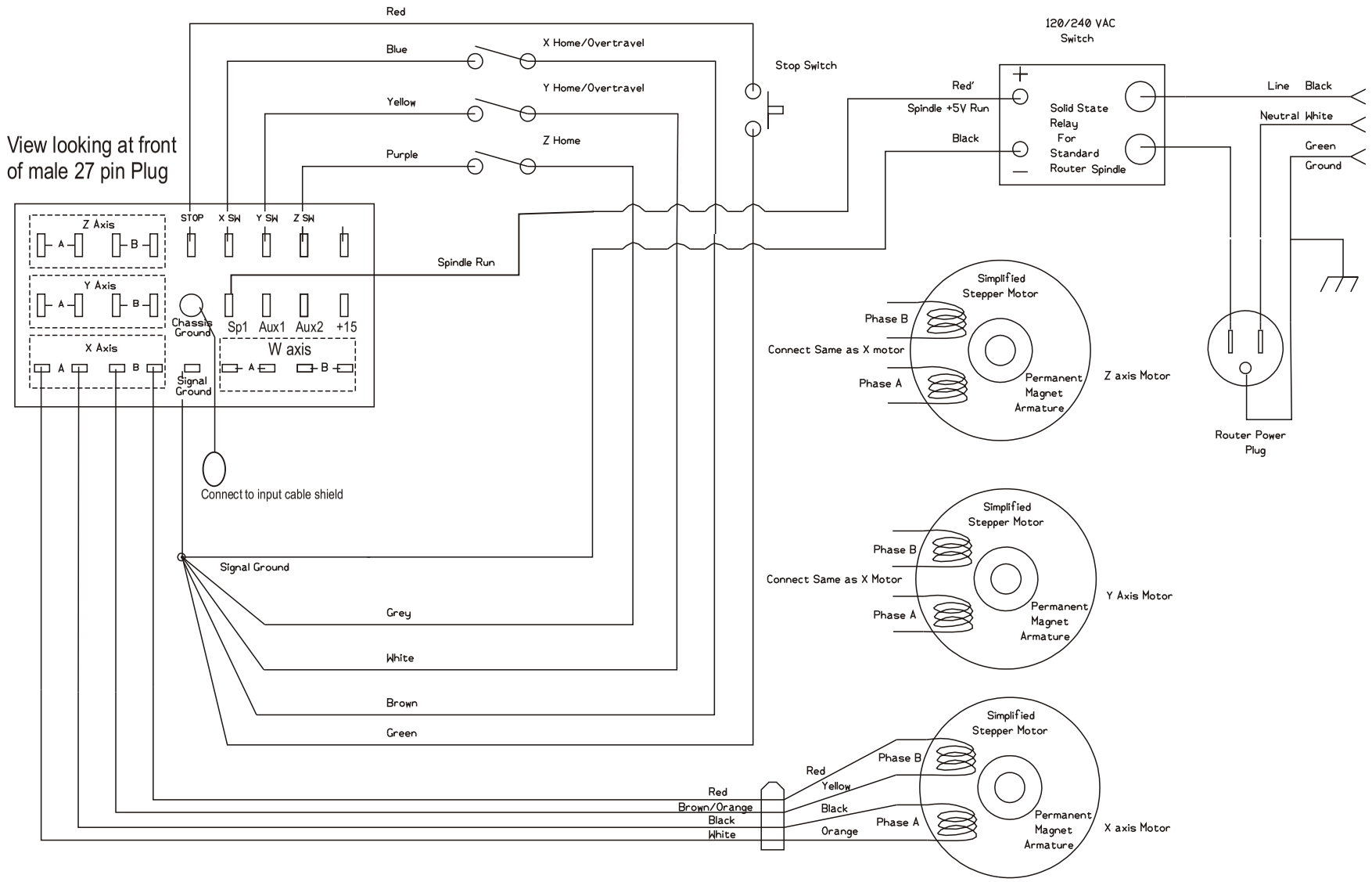








Note: Spindle 1 out and Aux2 out
can supply 20ma (max) to external relay
- Aux1 can sink 50ma (max) from the +15V supply



By Larry kenny

Step-Motor Table Wireing

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