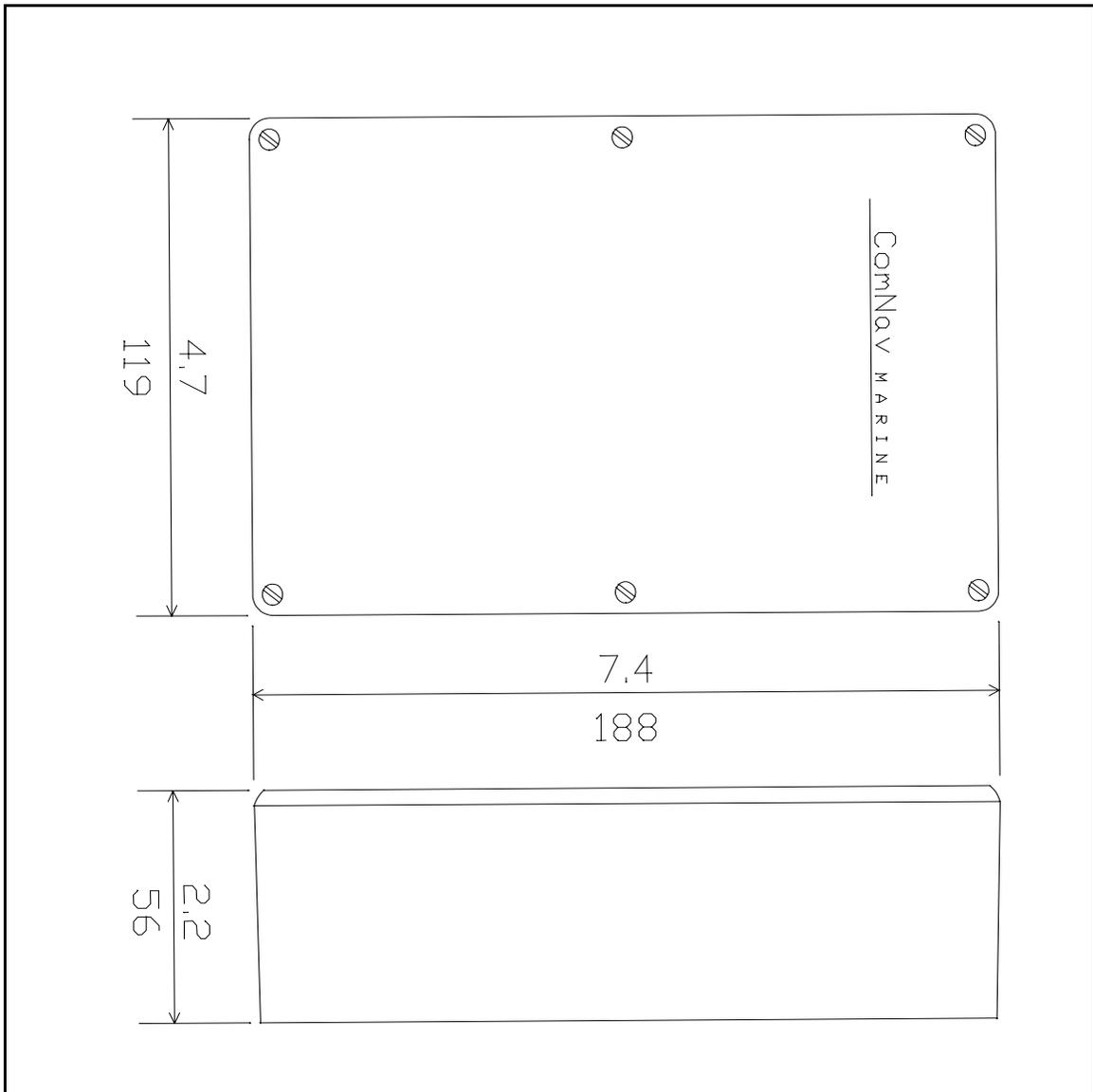




ComNav Marine Ltd.  
#15 - 13511 Crestwood Place  
Richmond, BC  
Canada V6V 2G1

Phone: 604-207-1600  
Fax: 604-207-8008  
E-mail: sales@comnav.com  
Web: www.comnav.com

**CT5 CONTROL BOX**  
Part # 20350004  
For Two Speed Hydraulic Manifolds  
(MANUAL # 29010027)



**CT5 CONTROL BOX**  
**Part Number 20350004**  
For Two Speed Hydraulic Manifolds

## INTRODUCTION

The CT5 Control Box allows a ComNav Marine autopilot to control either a Bypass Solenoid Valve or a Second 4-Way Valve in a two-speed hydraulic steering system. The valve is energized when large rudder movements are required, allowing faster rudder travel. As the rudder approaches the desired position, the valve is de-energized to slow the rudder down. For small rudder movements the valve is not energized. The CT5 control box has a potentiometer which controls the amount of rudder movement required to switch to high speed. It can be adjusted between 5 and 15 degrees of required rudder movement (the difference between the commanded and present rudder angles).

When used with a ComNav Marine CPUTSxx Uniblock, the rudder slow speed is adjusted using the Flow Adjust screw on the Uniblock, typically to 12 seconds hard-over to hard-over. The rudder high speed is factory pre-set in the pump, typically to 5 - 6 seconds hard-over to hard-over.

## INSTALLATION

**For mounting**, three #8 size holes are provided in the bottom of the CT5 Control Box. Mount the control box in a DRY location, ensuring that the terminals and fuses are easily accessible.

**The autopilot and the CT5 Control Box must be powered from the same breaker.** The maximum current draw from the autopilot is 4 amps and from the CT5 Control Box, 3 amps. A 7.5 amp breaker is recommended. To provide power to the CT5 Control Box use #16 AWG wire. To provide power to the autopilot, refer to the autopilot Installation and Operation Manual for the appropriate wire gauge.

**To connect between the autopilot and the CT5 Control Box**, refer to the hook-up diagram. 4 x #24 AWG wire with an overall shield is recommended. The shield should be terminated at the JOG COMMON or (-) terminal in the autopilot distribution box and unterminated at the CT5 Control Box. For a ComNav Marine 2001 autopilot with a version 1 distribution box (a Version 1 distribution box does not have a printed circuit board inside it), substitute RUDDER POWER for +5V, and RUDDER COMMON for COM.

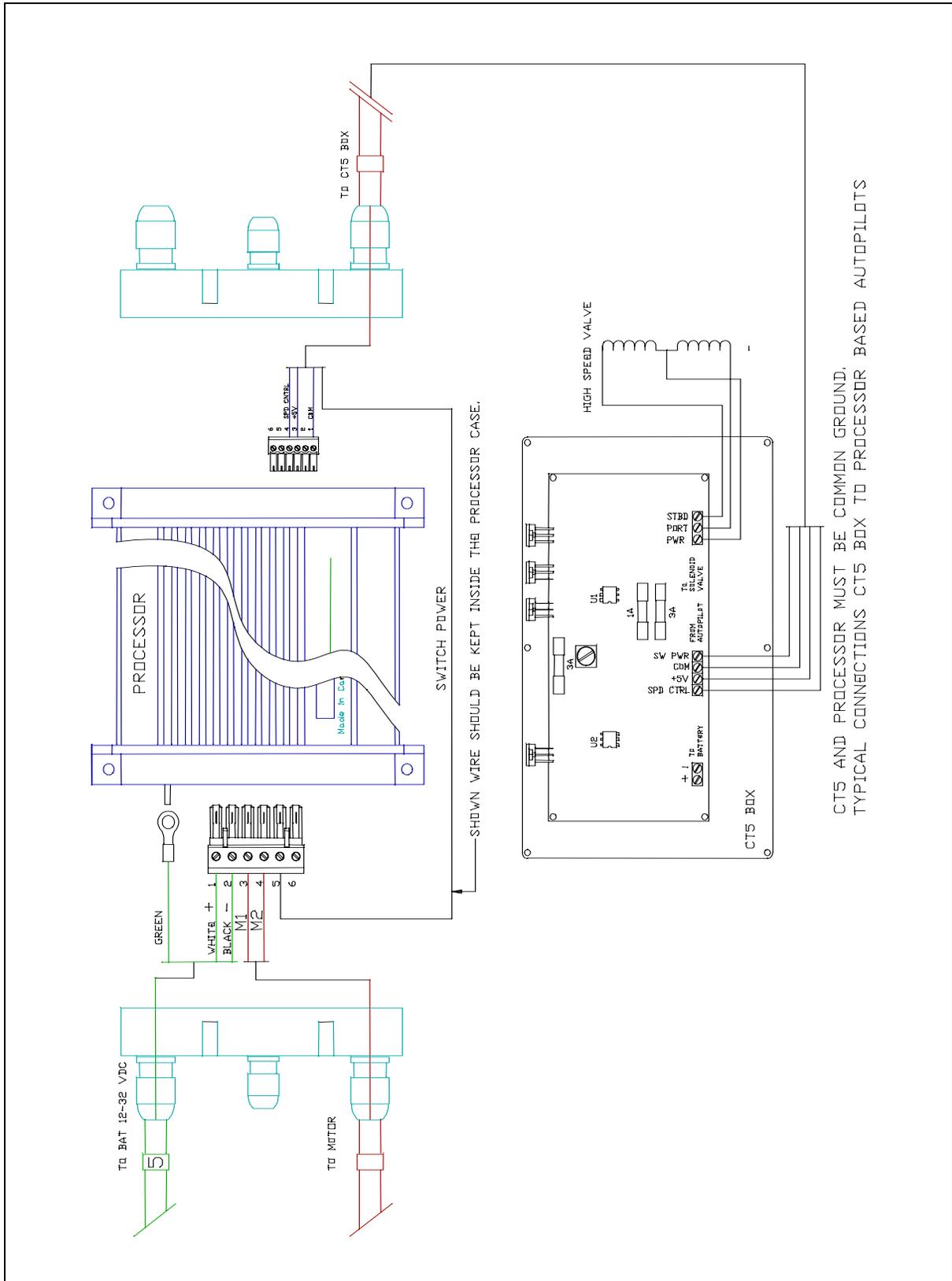
**To connect between the CT5 Control Box and the Bypass Solenoid Valve or Second 4-Way Valve**, refer to the hook-up diagram. 2 x #18 AWG wire for a Bypass Solenoid Valve or 3 x #18 AWG wire for a Second 4-Way Valve should be used. **Note that the Primary 4-Way Valve connects to the Autopilot Distribution Box as described in the autopilot Installation and Operation Manual.**

**To connect a Jog Lever to the Primary 4-Way Valve and the Bypass Solenoid Valve or Second 4-Way Valve**, a Double Pole Double Throw type of Jog Lever is required. Refer to the diagram for interconnection details. The addition of a toggle switch in the line from the Jog Lever to the (-) terminal of the CT5 Control Box will allow the choice of high speed or low speed jog lever operation. The Jog Lever can safely be used to override the Autopilot and the CT5 Control Box at any time.

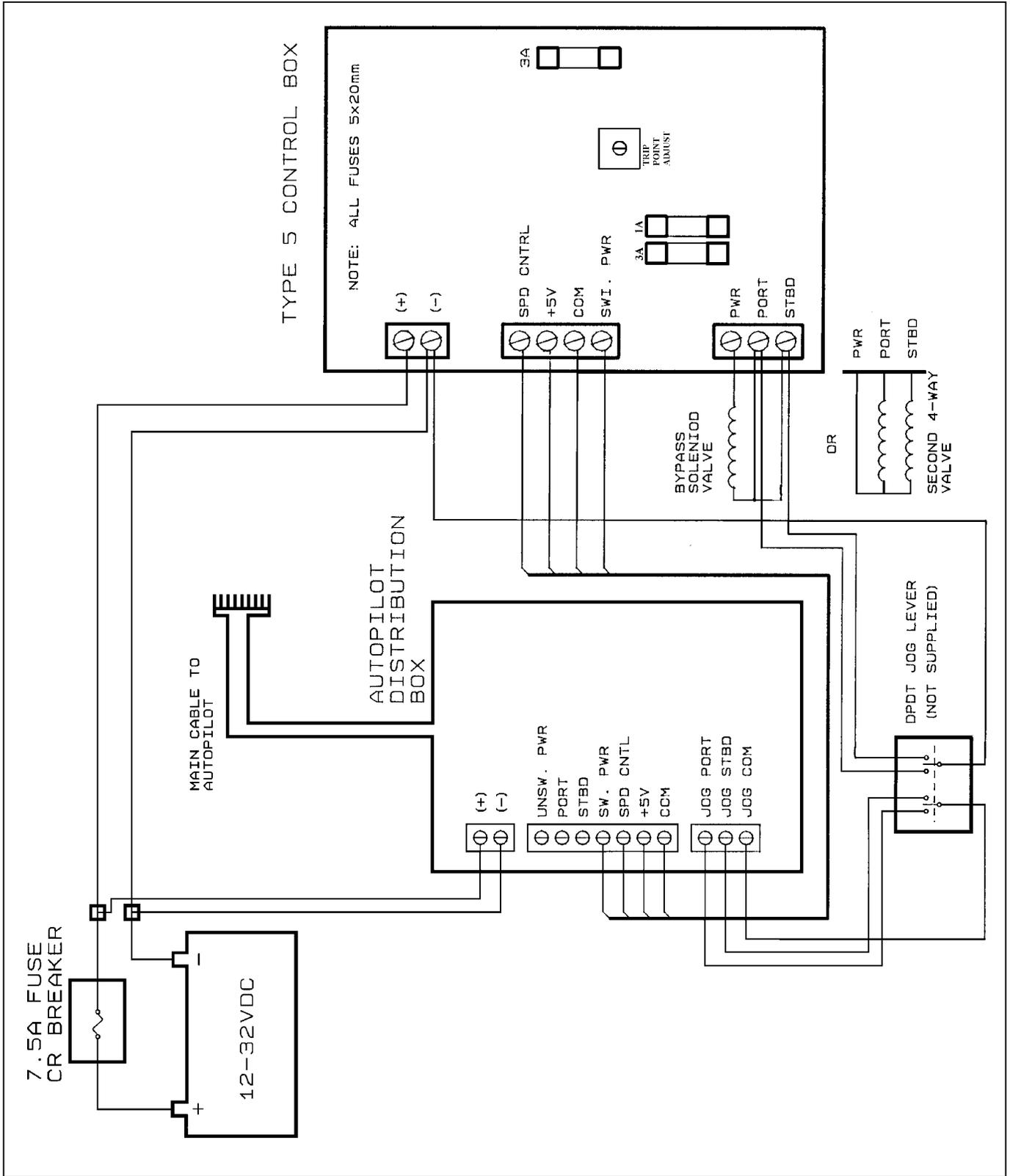
## TESTING

**Disconnect the Bypass Solenoid Valve or Second 4-Way Valve** from the CT5 Control Box until the Dockside Set-up procedure in the autopilot Installation and Operation Manual is completed.

- 1) Does the manifold have a Bypass Solenoid Valve or a Second 4-Way Valve? If it has a Bypass Solenoid Valve, go to step 2. If it has a Second 4-Way Valve, disconnect the common lead of the Primary 4-Way Valve in the autopilot Distribution Box to disable it. Connect the Second 4-Way Valve to the CT5 Control box as shown in the diagram. Place the autopilot master select switch in the **POWER STEER** position and touch either the red or green **ARROW** key. If the rudder moves the wrong way, reverse the PORT and STBD leads to the Second 4-Way Valve. Recheck that the rudder moves the correct way in response to the **ARROW** keys. Also check that any Jog Levers also move the rudder in the correct direction. Reconnect the common lead to the Primary 4-Way Valve in the autopilot Distribution Box.
- 2) **Stop the autopilot steering pump** (i.e. stop the engine or the electric motor which drives the pump). Set the **RUDDER** and **COUNTER RUDDER** controls to "0". Place the autopilot master select switch in the **PILOT** position. Turn the steering wheel until either the red or green output LED on the autopilot front panel lights up. Turn the rudder about ten degrees more in the same direction, and then adjust the Trip Point Potentiometer inside the CT5 Control Box until the same colour LED in the control box comes on (you should be able to hear the Bypass Solenoid Valve click at this point).
- 3) Turn the steering wheel in the opposite direction until the other LED lights on the pilot front panel, plus about ten degrees more (as above). If the same colour LED is already on in the control box, adjust the potentiometer until it just turns off. This completes the adjustment of the control box.
- 4) Return the **RUDDER** and **COUNTER RUDDER** controls to their normal settings. **Start the autopilot steering pump**. Place the autopilot master select switch in the **POWER STEER** position and use the **RED** and **GREEN ARROW** keys to run the rudder from completely hard over to completely hard over. The rudder should move at full speed until the rudder is about 10 degrees from its final position, and then at slow speed the rest of the way.
- 5) At the slow speed, check that your manifold can attain a hardover to hardover time of 10 to 15 seconds. This is the optimum speed for proper autopilot operation.
- 6) Check the Jog Levers for correct operation. If the toggle switch was fitted as suggested above, check the Jog Levers for both high and low speed operation.



Hookup diagram to processor based pilots



Hookup to 1001, 1101 & 2001 pilots.