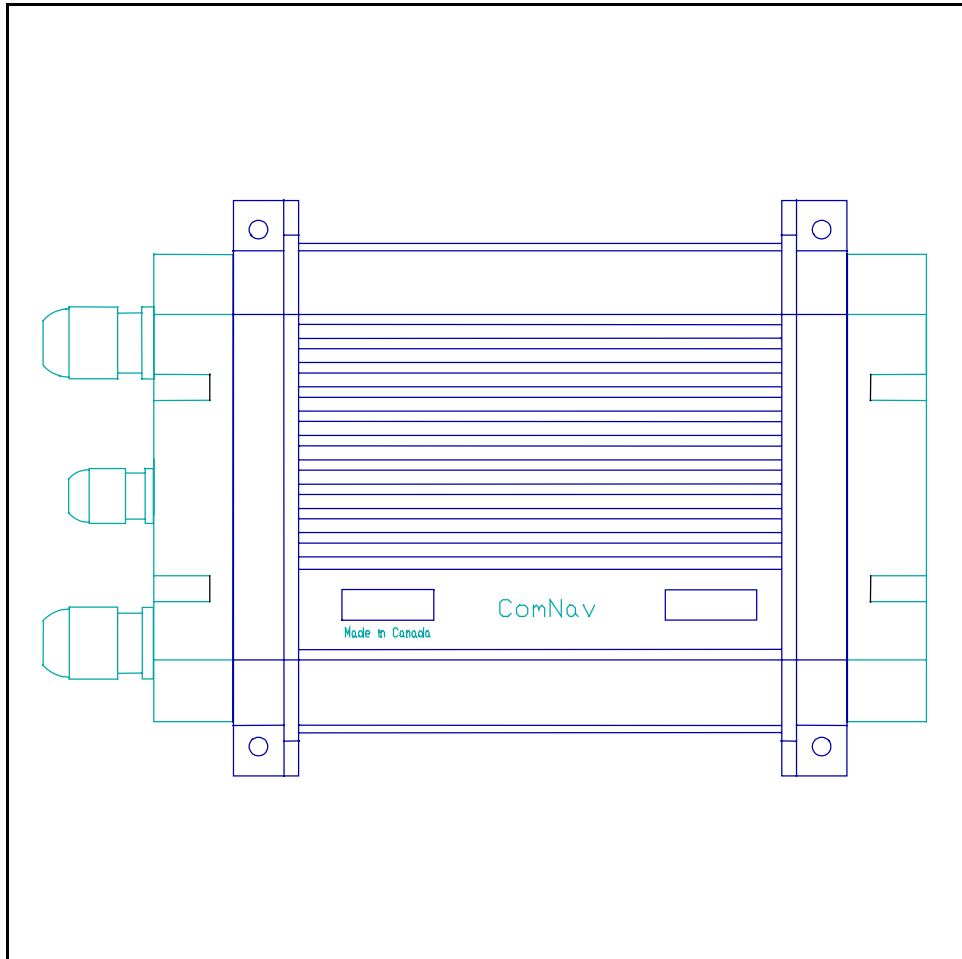


## CT3 MOTOR CONTROLLER (Part #20350002) For Three Wire, Split Field, D.C. Motors Installation Instructions (Revision 2) Revised March 03, 1999 (MANUAL # 29010025)



# **CT3 MOTOR CONTROLLER**

## **(Part #20350002) For three wire Split Field D.C. Motors**

### **Installation Instructions (Revision 2)**

#### **Introduction:**

The CT3 control box allows ComNav autopilots to control any split field (reversing, 3-wire) DC motor requiring less than 20 Amps.

The CT3 features reverse-pulse braking, which stops the motor immediately, achieving excellent rudder position control. Reverse-pulse braking helps to reduce motor wear by eliminating hunting action. No mechanical relays are used - all switching is solid state, eliminating such problems as relay sticking or contact pitting, providing higher switching speeds, and greater reliability.

Installation:

#### **WARNING**

**To ensure that the CT3 Motor Controller case will stay watertight, it is very important that you use round cables in all three watertight cable fittings. The two large cable fittings will require a cable with an outer diameter ranging from 5/32"(4.0mm) to 13/32"(10.0mm). The smaller cable fitting will require a cable with an outer diameter ranging from 3/32"(2.5mm) to 1/4"(6.5mm).**

For mounting, a #10 size hole is provided in each foot of the CT3 Motor Controller box.

**The autopilot and the CT3 Motor Controller must be run from the same source of power,** although they do not need to be powered from the same breaker. In fact, for installations which use two drive units, it is preferable to power the autopilot and each CT3 Motor Controller from a separate breaker. This way either or both drive units may be selected to operate independently from the autopilot.

**To provide power to the CT3 Motor Controller** use #12 AWG wire if the combined run from the breaker to the box, and from the box to the motor, is 25 feet or less. If the combined run is greater than 25 feet use #10 AWG wire. Run the power lead from a 30 Amp breaker to the CT3 Motor Controller.

**If the autopilot is powered from the same breaker as the CT3 Motor Controller,** run a separate wire from the breaker to the autopilot as shown in the diagram. **DO NOT** run the power lead to the autopilot from the CT3 Motor Controller. Before providing power to the autopilot, refer to the autopilot Installation and Operation Manual for the appropriate wire gauge.

**For the correct interconnection of the CT3 Motor Controller and the autopilot**, refer to the drawing on the following page. With 1001, 1101 and 2001 autopilots, a 2 conductor #24AWG cable plus shield will be satisfactory. The shield of the cable should be terminated to the **JOG COMMON** terminal (or **V-**) in the autopilot distribution box and unterminated at the other end.

With ComNav Processor type Autopilots, a 2 conductor, #24AWG cable plus shield will be satisfactory. The shield of the cable should be terminated to the GROUND LUG on the Processor Box and unterminated at the other end. **The shield is recommended but is not necessary.**

If jog levers are used to override the autopilot, connect them to the terminals provided in the autopilot Distribution Box or Processor (see the autopilot manual).

## **SETUP:**

On 1001, 1101 and 2001 Autopilots, turn the autopilot on and set the pilot to **POWER STEER** mode. Press the **PORT** arrow or dodge key. If the rudder moves to starboard, reverse the wires to **CT3** terminals **M1** and **M2** in the control box. On ComNav Processor type autopilots, this procedure is not necessary as the Processor software automatically changes drive reversals.

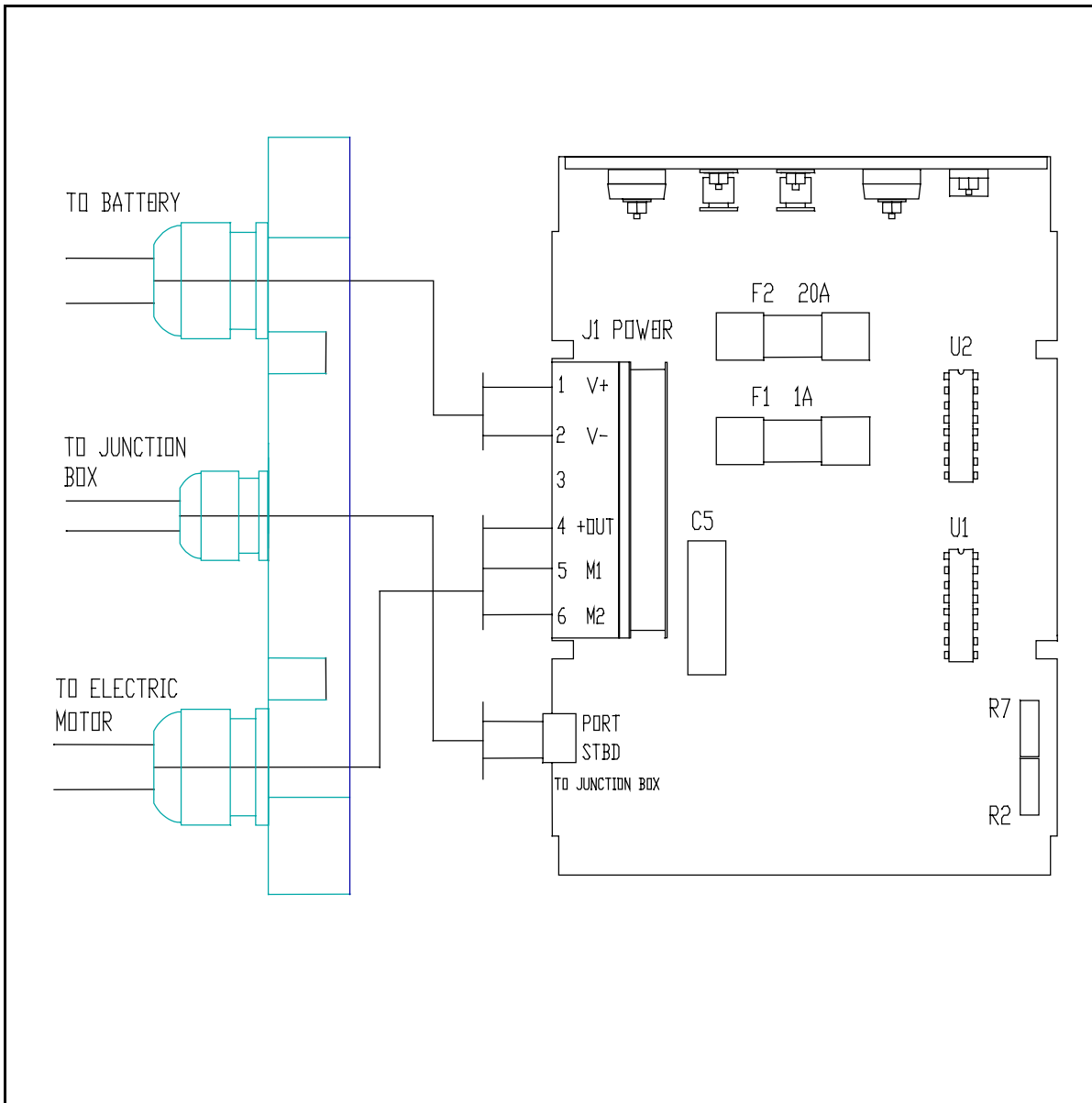
The function of the control box is to provide a short pulse of reverse power to the motor after every movement of the rudder. This acts as a brake, stopping the motor immediately. To set up the control box correctly, place the autopilot in POWER STEER, press the PORT arrow key, and release it. If the motor stops completely, The Port Stop Adjustment is correct. If the motor did not stop, open the right hand side of the box and adjust as follows: if the motor coasts on to port when the PORT arrow key is released, turn the port potentiometer (R2) clockwise until the motor stops completely. If the motor stops and reverses slightly, turn the PORT potentiometer (R2) counter-clockwise until the motor stops completely. Repeat this procedure with STBD arrow key and STBD (R7) potentiometer (refer to the following page for details).

**To measure the maximum hard-over to hard-over time of the drive system**, place the autopilot master select switch in the **POWER STEER** position and hold either the red or green **ARROW** key or the **PORT** and **STBD** pushbuttons to make the rudder move fully from Port to Starboard or vice versa.

**If the hard-over to hard-over time is less than 8 seconds**, the rudder must be slowed down by decreasing the pumpset displacement, changing to a smaller pumpset or a slower acting drive unit.

**If the hard-over to hard-over time is more than 16 seconds**, the rudder must be speeded by increasing the pumpset displacement, changing to larger pumpset or a faster acting drive unit.

When the hard-over time is between 8 - 16 seconds, testing of the CT3 Motor Controller Drive Box is complete.



**CT3 WIRING DIAGRAM**

**WIRING:**

**CT3 MOTOR CONTROLLER TO 1001, 1101 AND 2001 AUTOPILOTS**

CT3 terminal marked **PORT** connects to the 1001, 1101 or 2001 Distribution Box terminal marked **PORT**.

CT3 terminal marked **STBD** connects to the 1001, 1101 or 2001 Distribution Box terminal marked **STBD**.

**CT3 MOTOR CONTROLLER TO COMNAV PROCESSOR TYPE AUTOPILOTS**

CT3 terminal marked **PORT** connects to the Processor Pump Motor terminal marked **M1**.

CT3 terminal marked **STBD** connects to the Processor Pump Motor terminal marked **M2**.

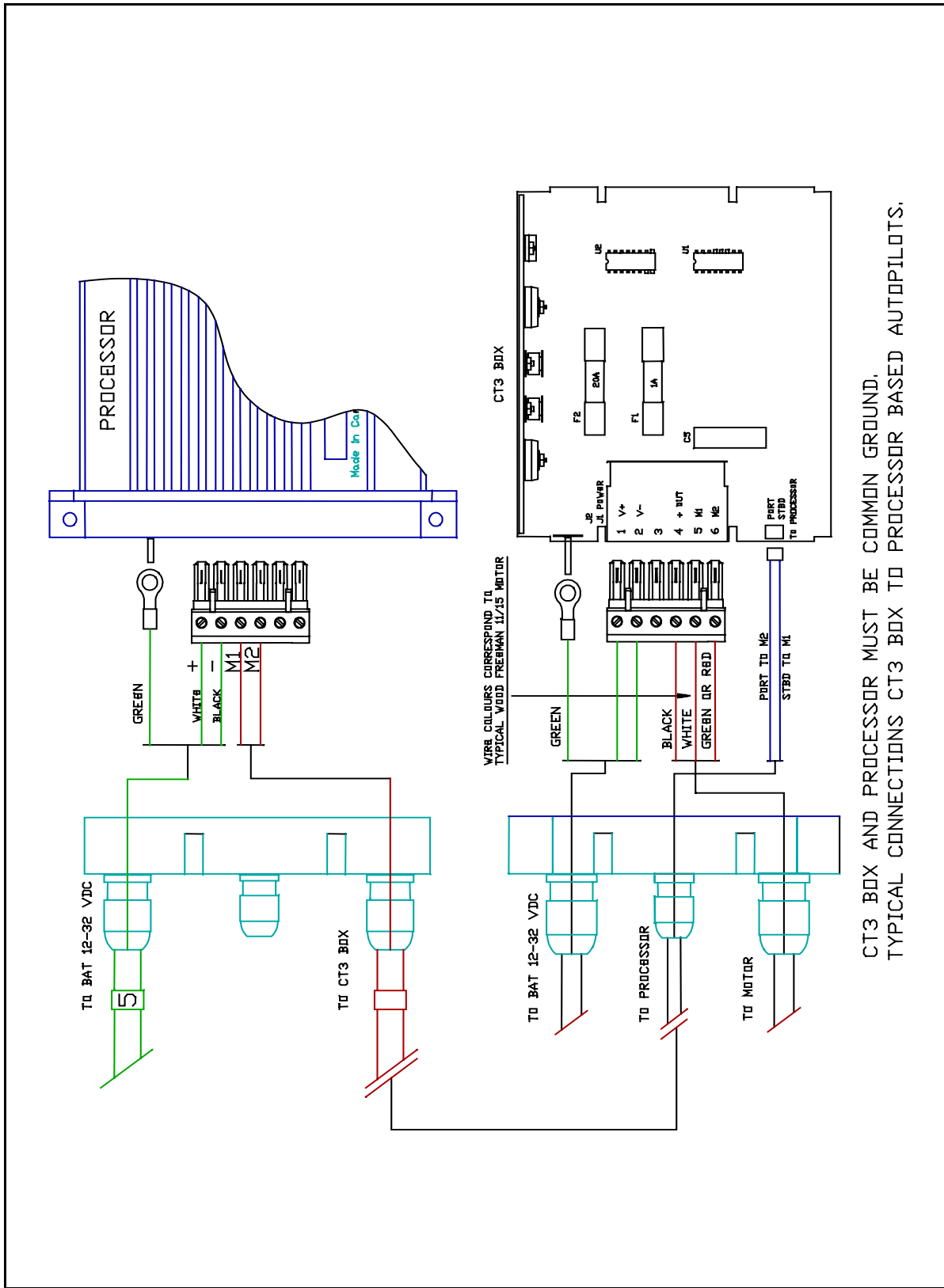


Figure 3: CT3 Connections to Processor Based Autopilots

MANUAL CHANGES

DECEMBER 31, 1996

PAGE 3 - ADDED WARNING ABOUT ATTAINING CORRECT HARDOVER TIME.

JANUARY 30, 1997

PAGE 5 - ADDED CT3 TO PROCESSOR DRAWING

November 17, 1998

Converted manual to Word.

MANUAL CHANGES

DECEMBER 31, 1996

PAGE 2 - WARNING ADDED ABOUT ATTAINING A 10 TO 15 SECOND H.O. TIME.

JANUARY 29, 1997

PAGE 4 - ADDED CT5 WIRING TO PROCESSOR BASED AUTOPILOTS

SEPTEMBER 6, 2000-09-06

CHANGED LETTERHEAD