

# ***TR-1 Gladiator***

**LCD Heading Display  
Installation & Operations  
Owner's Manual**



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## TR-1 Gladiator LCD Heading Display Installation and User Guide

Thank you for purchasing the TR-1 Gladiator Display. This guide contains an explanation on how to install and use your new TR-1 Display. Please be sure to read this instruction manual fully to familiarize yourself with the features and proper installation and operation of this display.



Figure 1-a



Figure 2-a

### **Introduction:**

The TR-1 LCD display connects to the TR-1 Gladiator Autopilot. It displays current heading, and displays the current autopilot mode. In addition it allows the operator to command a new desired heading or command a rate of turn. With an optional rudder reference indicator; purchased separately, the display will show rudder position.

The large easy to read transfective static LCD display with an anti-reflective coating gives you a clear view of the screen from any angle on the boat or in glaring sunlight and is backlit for easy night vision.

An optional mounting panel is available. See Figure 2-a. This panel will allow you to flush mount a handheld, and mount the deckmount On/Off switch, in addition to the LCD Display.

## Safety

**You are responsible for the safe and prudent operation of your vessel. Your TR-1 Autopilot is a tool that will enhance your capability to operate your boat and catch fish. It does not relieve you from the responsibility for safe operation of your vessel. You must avoid hazards to navigation and never leave the helm unattended.**

- You must always be prepared to promptly regain manual control of your boat. The autopilot can fail and hard over.
- **Learn to operate your autopilot on calm and hazard free open water.**
- In case the autopilot becomes inoperable, remove the in line fuse from the battery power cable.
- If available, always use the engine kill lanyard when operating your boat.
- Use caution when operating the autopilot at high speeds near hazards in the water, such as docks, pilings or other boats.

## Before Starting Installation

Study this manual and the other manuals provided with your autopilot carefully, and familiarize yourself with all of the components and their intended or required mounting locations. Ensure there is adequate space available for installation before cutting or drilling holes. Take extreme care when cutting and drilling, to avoid the possibility of damaging other components in the boat, and avoid possible personal injury. Be sure to follow the instructions carefully and thoroughly. Nautamatic Marine Systems, Inc. cannot accept responsibility for installations where the instructions have not been followed, where substitute parts have been used, or modifications have been made to our products.

# Installation of Basic LCD Display

## **Installation Overview:**

- Figure out where on your dash you want to mount the display, or optional mounting panel. Be sure to allow plenty of room in the back of the display for mounting accessibility.
- You will need good visibility and convenient reach of the display.
- Cut a 3-3/4" hole in the desired location.
- Mount the display using the mounting hardware provided.
- Make the proper wire connections to the ECU, the Handheld and to the rudder reference indicator (optional).
- Turn the Gladiator autopilot system on with the deckmount On/Off switch and verify display connections. The display should momentarily light up all functions of the display, then show all OOO's across the heading display and STBY will blink for 30 seconds and then display STBY as the mode selection.
- If the Rudder Position Indicator Transducer is used, it must be installed and calibrated before this mode will work correctly. See pages 11 & 12 of this manual.

## **Tools required:**

Electric Drill  
3.725 dia. hole saw  
5/16" open end wrench  
Safety Glasses

## **Additional tools for Mounting Optional Panel:**

File for making additional clearances  
.75 dia. hole saw  
.156 or 5/32" drill bit

# Mounting the Display Unit

You will want to decide where to mount the display unit. Mount the display in a place where you have good visibility and a convenient reach to the dial. (The outside diameter is 4" and 4-1/2" with the trim ring.)

Using template (A) provided, you have two options for mounting the Standard display unit:

**Type I Template:** Cut a 3-3/4" diameter hole (3.750). Use the mounting strap provided and place it over the two studs, and against the back of the panel. Place the #6-32 UNC thread nuts provided onto the studs and snug the nuts to 60 **inch ounce** max torque (.42Nm). (Do Not Overtighten nuts) (The use of thread lock compound like loctite might be a good idea.) The standard stud will accommodate a panel 1/2" thick (.50) with the trim ring and 3/4" (.750) without the trim ring.

OR

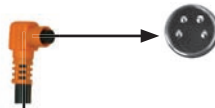
**Type II Template:** Cut a hole using the template as guide and drill holes as marked for the studs on the back of the unit to go through, this eliminates the need of the strap. The unit is held in place using the studs on the back of the face plate and the nuts provided. (Do not overtighten nuts on the studs)

## **Multi-Mount Panel Installation:**

Using the template provided, you will be drilling holes to provide access to the back of the display, the deckmount switch, the handheld and the four (4) mounting studs.

Place the #6-32 UNC thread nuts provided onto the studs and snug the nuts to 60 **inch ounce** max torque (.42Nm). (Do Not Overtighten nuts) (The use of thread lock compound like loctite might be a good idea.)

# Connecting the Display Wiring



Connects to the ECU's  
Connection # 3



To Optional  
Rudder  
Indicator



Connects to the  
autopilot's handheld

Connection to Optional  
rudder indicator unit.  
Red= ( + ) Positive  
Black= ( - ) Signal  
Silver= (Grnd)

# Connecting the Display With Wireless Remote

## Option 1

Connects to the ECU's Connection # 3



Display



Wireless Receiver



Connects to the autopilot's handheld



## Option 2

Connects to the ECU's Connection # 3



Wireless Receiver



Display



Connects to the autopilot's handheld



## Operating the Display



Setting your display for accurate heading output:

The heading display displays the current heading of the vessel. The compass must be calibrated and north set for this display to be correct. Please see your Gladiator's Owner's Manual for these instructions.

The heading on the display may not match your compass or your GPS. This is normal. Once the Gladiator system's compass has been calibrated and north has been set, it may be the most accurate heading display on your boat.

## LED Backlight Control

There is an LED backlight to be used in low light conditions. The backlight is activated and adjusted by pressing and holding the directional input dial for greater than 4 seconds. The backlight will cycle through six (6) separate intensities while the dial is being held down. Let up on the dial when the desired intensity is reached.



## Display Elements:



Figure 10

The Three large digits on the display show the current heading in degrees. (See Figure 10)



Figure 11

If the autopilot is in calibration mode, (Autotune, Compass Calibration, or rudder calibration) the three digits will display “CAL”.



Figure 12

The Three smaller digits display a horizontal bar (See Figure 12) if the heading command mode is available.



Figure 13

It will display the new commanded heading (desired heading) (See Figure 13) if the operator has turned the control knob while the heading command mode is active. The display is blank otherwise.

## Heading Command Display



Figure 16

The heading command display will be blank if the heading command function is unavailable. See Figure 16. The heading command is available whenever the autopilot is in heading hold (AUTO) and the display turn rate command is inactive. It will display a single horizontal bar until the operator enters a heading command by turning the command knob. (See figure 12)



Figure 17

The heading command starts at the current heading and either increments or decrements from there depending on the direction the knob is turned. The command is limited to (+) or (-) 180 degrees from the current heading. The autopilot will immediately begin to turn to the new course when the command is entered.

Turn the dial to the right slowly for one (1) degree increments. Turn the dial left slowly for one (1) degree decrements. The increment is rate sensitive. The faster the knob is rotated the greater the increments.



Figure 14

There are three annunciator displays indicating the current autopilot mode; AUTO, STBY, and GPS. AUTO is displayed if the autopilot is actively steering the vessel. STBY is displayed if the autopilot is in standby mode. GPS is displayed if the autopilot is using the navigation data from the GPS.



Figure 15

There are a series of bars at the bottom of the display to indicate the command turn rate or the rudder position. (It will only show the bars for either mode, not both at the same time.) See Figure 15.

## Rate of Turn Command Dial

The “Rate of Turn Command Dial” on the display controls the boat somewhat like your steering wheel at the helm. Turning the dial either clockwise or counterclockwise will cause the autopilot to execute a turn and make a continuous rate of turn until the dial is turned in the opposite direction until only a single vertical bar is displayed. As you continue to turn the dial, more vertical bars display, and the rate of turn will execute more quickly.

Example: With two vertical bars to the right showing on the display would be like turning the wheel at the helm to about the 2 o'clock position and holding it there.

You can take control of the boat at any time just by pressing and releasing either straight arrow on the handheld or grabbing the wheel at the helm and turning it in any direction. Steering from the helm will cause the Shadow Drive to temporarily dis-engage the autopilot, and the Rate of Turn command will drop out. When the boat is steered on a steady course, the autopilot will re-engage in heading hold mode. You will need to press the Rate of Turn Dial again to activate the turn rate command.



Figure 18

The turn rate command is activated by a single press of the directional control dial.

A single centered vertical bar will indicate the mode is active. See Figure 18

## Rudder Position Display

The rudder position display is optional. If you wish to use this portion of the display, you will need to purchase an aftermarket transducer unit.

The rudder position display is activated by a mode selection from the handheld on the autopilot. A rudder position transducer must be installed and calibrated before this mode will work correctly. The rudder position is indicated by the bars at the bottom of the display. See Figure 19.

The rudder indicator must be calibrated before use.



Figure 19

Activating this mode will not prevent the use of the rate turn command, but the bars will indicate the rudder angle NOT the rate of turn.

## Rudder Calibration

**Before you start:** You must orientate your rudder indicator or center the potentiometer according to the manufacturers instructions. This must be done before the calibration is started.

The rudder indicator must be calibrated before use. Follow these steps;

1. Center the rudder.
2. Enter autopilot setup by pressing and releasing the [SETUP] button on the handheld remote. Enter code 59 by Pressing and releasing the left Chevron Button on the handheld two (2) times

to illuminate the 5 LED, and pressing and releasing the [Right Chevron Button] Three (3) times to illuminate the 9 LED.

3. Press the [up arrow] button on the handheld remote, the up arrow LED will light and the display will indicate CAL.
4. Using the steering wheel at the helm, turn the rudder all the way to starboard.
5. Using the steering wheel at the helm, turn the rudder all the way to port.
6. Press the down arrow on the handheld, the display will no longer indicate CAL.
7. Press and Light the Setup LED and enter code 109.
8. Press the up arrow button, the display will now indicate rudder position.
9. If you want the display to continue to indicate rudder position, you must save the CAL.

To save the CAL and continue with rudder position as the startup default, press and hold the [Select Load] button on the handheld, while holding down [Select Load], press and release the [Deckmount] button. This will save this selection into permanent memory in the autopilot.

To turn off the rudder position on the display; Press, release and light up [Setup] on the handheld remote. Enter code 109 on the handheld remote, press the [Down Arrow] on the handheld remote. If you wish to save this as the startup default, you will need to press and hold the [Select Load] button on the handheld, while holding down select load, press and release the [Deckmount/On/Off] button. This will now save this selection into permanent memory.