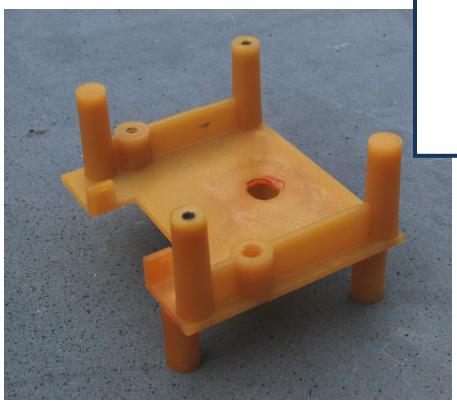
## The AirGlide GPS Upgrade for:

# AirGuide Model 2025 w/ a plastic internal frame

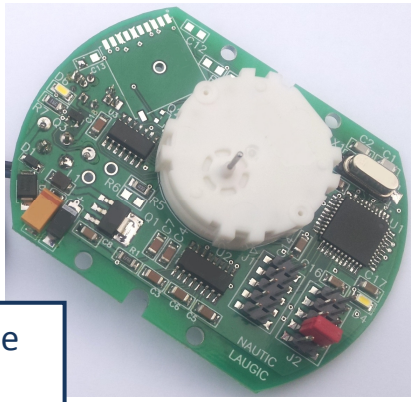
**This Kit includes all the components necessary to upgrade the Pitot driven speedometer to GPS.**
**The finished gauge will look and mount exactly has it did originally. The integrated Backlights are life-time LEDs.**
**This document outlines the step-by-step conversion procedure and installation.**


ORANGE BAND GPS TYPE:

THESE INSTRUCTIONS ARE ONLY FOR AIRGLIDE KITS SOLD BEFORE OCTOBER 2014.



Plastic Internal Frame



AirGlide GPS Upgrade

# The AirGlide Kit, Tools, and Prep

## Contents:

| QUANTITY | DESCRIPTION |
|---|---|
| 1 | AirGlide Retro-fit Assembly (AGR) |
| 1 | Swift GPS Receiver (Orange) or GPS Y-Splitter (Orn-Orn-Orn) |
| 2 | Screw, FltHd, #2-56 x ¼" |
| 2 | Washer, #6, Nylon, Black |
| 1 | Grommet, Rubber |
| 1 set | Calibration Wires |

## General Small Tools and Material Required:

| DESCRIPTION |
|---|
| SCREW DRIVERS: PHILLIPS (#0-0, #1, #2) / SMALL FLAT-HEAD (2) |
| PLIERS: NEEDLE NOSE / STANDARD |
| ASSORTED NUT DRIVERS |
| ASSORTED WRENCHES |
| DIAGONAL CUTTERS |
| FLAT FILE (COURSE AND FINE) |
| DRILL MOTOR with ¾' Counter-Sink Bit |
| |
| SOFT CLOTH, MASKING TAPE, WINDOW CLEANER |
| |


## Prep: This Is VERY Important!

**Rotate the AGR motor shaft to its full counter-clockwise (CCW) stop.**

1. Grasp the AGR board edges in your left hand with the motor facing you. Pinch the rotor shaft with your right thumb and index finger.
2. Hold the pinched shaft stationary, rotate the AGR board 90 degrees CW (and thus the rotor turns CCW). Note: The rotor movement is so smooth, you're unlikely to sense it.
3. Release your pinch on the rotor. Re-Cock the AGR to rotate it CW again.
4. Repeat steps 1 thru 3, four to five times.

## Jumpers: This Is VERY Important! Do Not Alter the AGR Jumpers. These are set by the Factory for this model.

# Disassembly

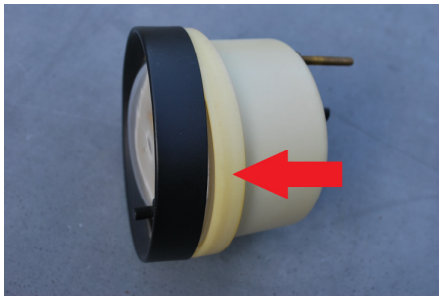
Begin with the gauge removed from dash: Thereby, free the Pitot hose (cut if necessary). Remove the Backlight, by pulling it from the case. And remove the mounting bracket.

*** Remember to always protect the Lens Face with a soft cloth or pad to avoid scratches.

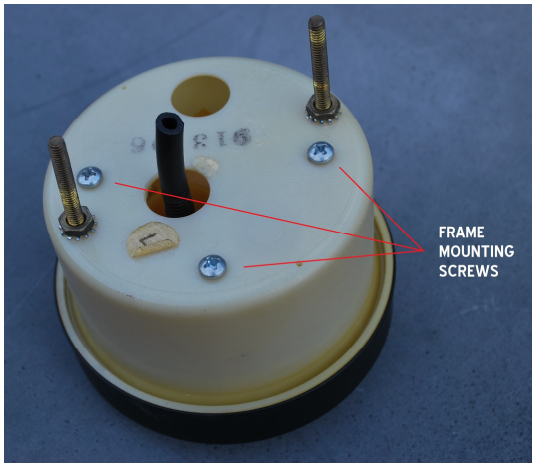
*** Refrain from discarding removed parts! Some are reused.

*** This process is irreversible. For some mechanical parts are ruined as to expedite and ease the upgrade procedure.

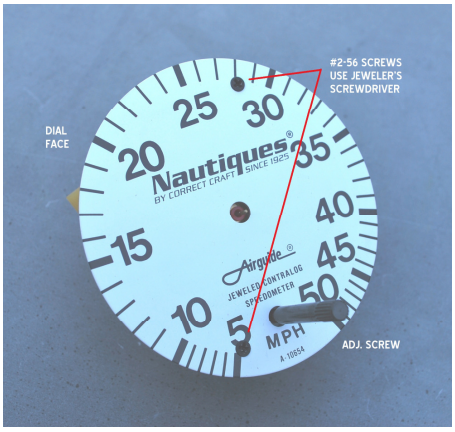
*** FOR BEST RESULTS, READ THE ENTIRE PROCEDURE FIRST!



1. With your fingers, gently pry/slide the bezel off.
2. Remove the Frame Mounting screws; use a #2 Phillips screwdriver. The screws are threaded into frame posts which support the internal frame. Remove all three screws.
3. From the front, remove the entire dial from the case: this includes the Lens, Lens Gasket, Dial and plastic frame.
4. Slide the Lens/gasket up and off the Adjustment screw.




5. Pry the indicator needle loose from the rotor:
    a. To protect the dial face, place 2 masking tape strips under the needle, on opposite sides of the rotor.
    b. Near the rotor, slide two small flat head screwdrivers under the needle from opposing directions. With their blades flat on the tape, gently twist/pry the screwdrivers shafts up to release the needle.




6. Separate the Dial from the frame.

Remove the Dial Face screws using a Phillips #00 screwdriver: Set the frame (face-up) on a table. Firmly press the screwdriver into the screw heads and briskly twist CCW, as release the screw, yet not strip the head slots. These #2-56 x 1/4" screws are small... set them aside for later use.

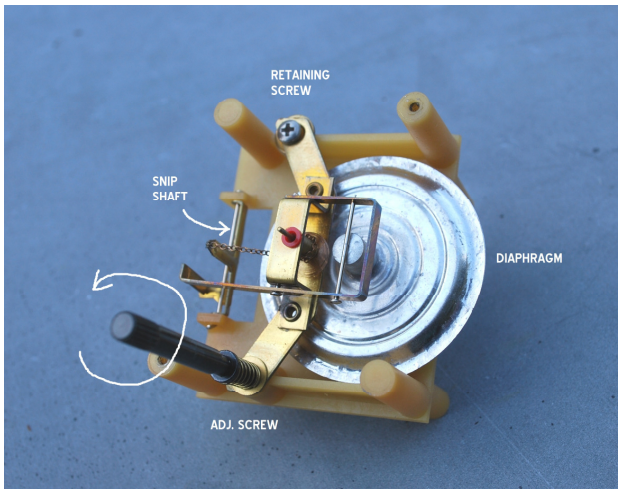
7. Now evacuate all the pressure-mechanical components from frame.

   a. Using Diagonal Cutters, snip the spindle shaft, and remove.

   b. Continue to turn the Adjustment Screw Counter-Clockwise until it's loose, and remove. Save its spring and washer.

   c. Find the Retaining Screw and use a #1 Phillips screwdriver to remove it.

   d. Grasp the diaphragm with pliers, and remove its nut with a 7/16" wrench. Remove the Diaphragm.



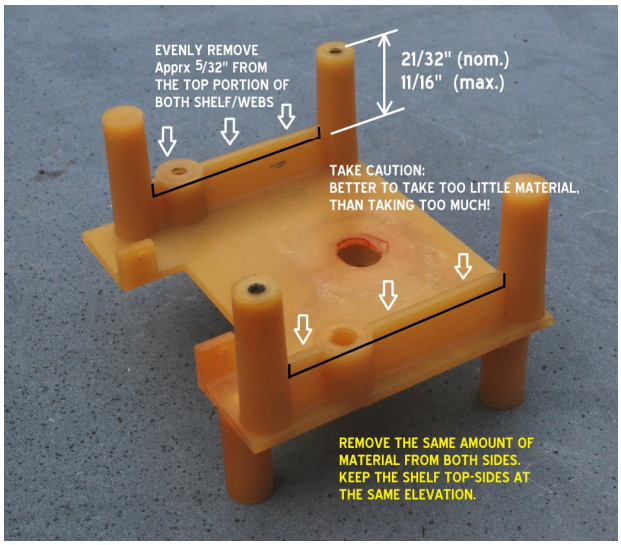

8. Frame modifications: (read the entire section before beginning)

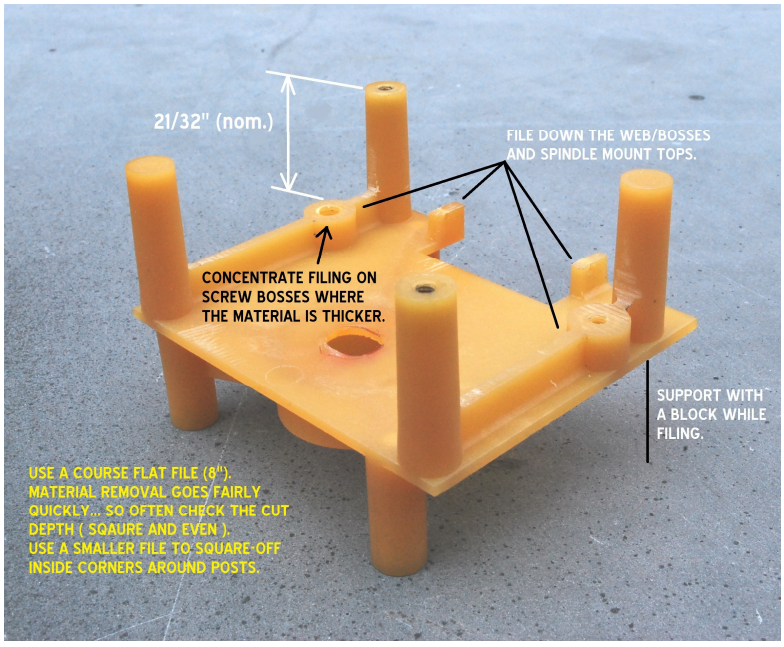
   a. OBJECTIVE ➔ For the proper rotor-to-dial registration, the shelves (webs) on either side of the frame must be reduced. Remove approximately 5/32", such that the Dial mounting posts extend 21/32" above it.

   b. FIRST, with a permanent fine point pen, mark the appropriate target depth on the web sides.

   c. Support the 'leg-less' corner with a wooden block.

   d. Use a course Flat File to remove the plastic web, screw-boss, and spindle mount tops down to the prescribed depth:




The material is relatively soft, and is quickly removed with the file... so easy does it. Check your cut depth frequently; error on the side of caution, take less rather than more. Avoid getting the webs too shallow. This will place the AGR board too low, allowing the needle to rub on the dial.

   e. Use a fine Flat File to square the top surfaces: even the cut from post-to-post, and one web to another.

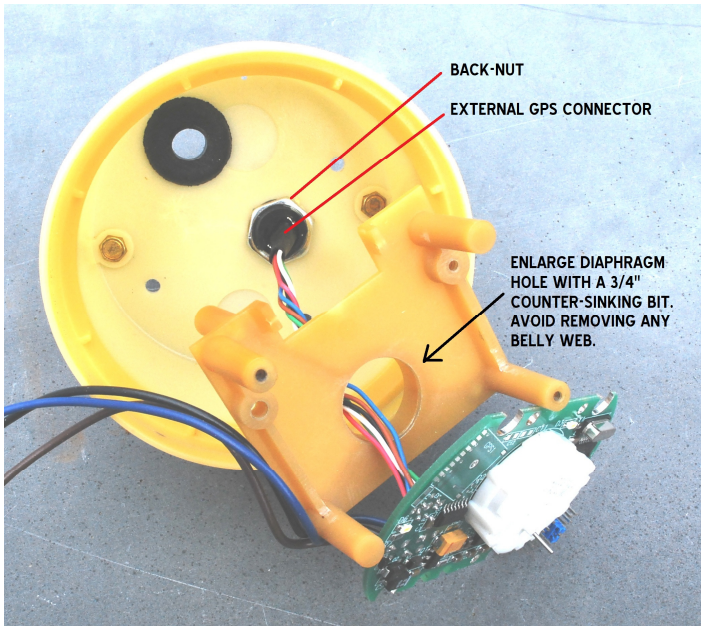
   f. Slide the AGR down over the dial posts; the AGR will only fit one way. Inspect the frame modification for a flat, proper fit; tune the modifications as needed.

g. To allow space for the External GPS connector and wire-pigtail, the Diaphragm nipple hole is widened. The best approach is drilling with a ¾" counter-sinking bit; see pic under Tools. Avoid using a TWIST DRILL BIT; they're too aggressive and will likely damage/crack the plastic frame. To drill rest the frame directly on its belly web. Enlarge the hole only up to the circular belly web. This web is required for frame strength... avoid removing any of it.

Note: when a counter-sink drill bit is unavailable, use a round circular file.

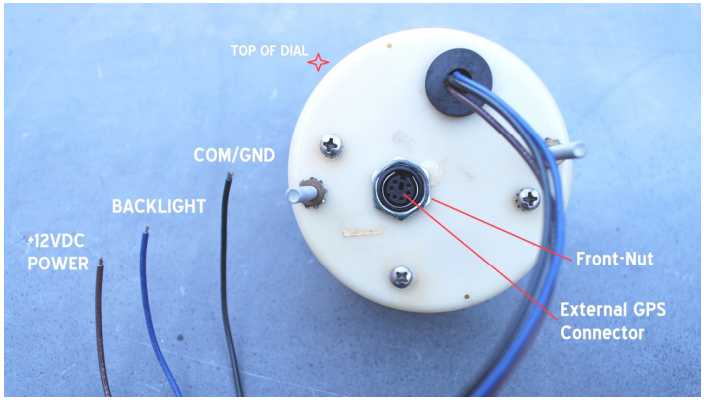
h. Thread the Retaining screw into the frame to make sure the frame threads are clear and cut. Do the same for the Adjustment screw. Remove both screws.

9. Clean the Dial Face.
10. Clean the Case.




## Assembly

1. Insert and seat the rubber grommet into the case at the old Backlight hole.
2. Ensure the case Mounting-bracket studs are secure. When necessary tighten the nuts with a ¼" nut-driver.
3. Secure the External GPS connector to the case:
   a. Remove the Front Nut from the External GPS Connector. And retract the Back-nut (CCW) leaving all its threads fully engaged.
   b. From within the case, slip the External GPS connector thru the frame and into the case's center-most hole.
   c. Outside the case, apply the Front-Nut. Point the connector keyway towards the Top of Dial. Snug tight with a 17mm wrench(s).



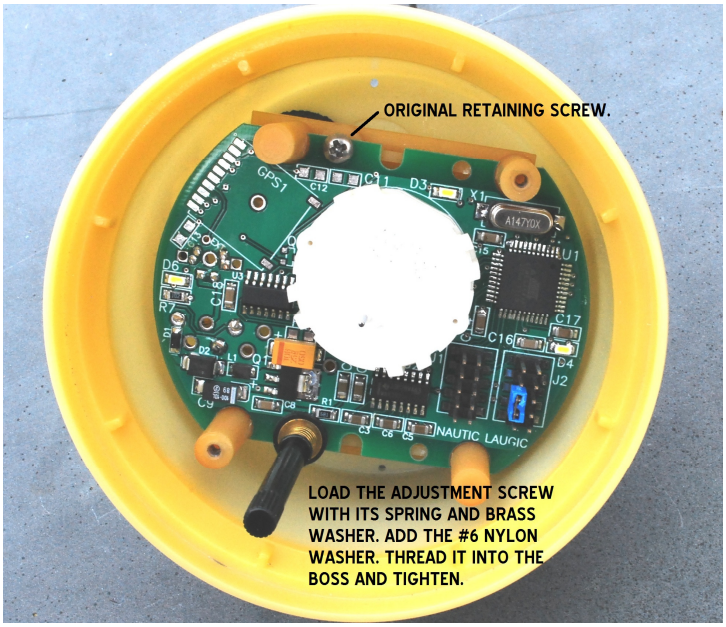

4. Feed the BRN/BLU/BLK wires thru the rubber grommet.
5. Fasten the Frame to the case:
   a. Align the 'legless corner of the frame over the grommet, and slide the frame into the case.
   b. Start each frame mounting screw thru the case backside and into a frame post. As required, slightly rotate the frame to align each post with a hole.
   c. With all three screws inserted, press the frame down squarely into the case bottom, and center. Inspect to ensure no wires are pinched/trapped beneath the posts.
   d. Tighten the screws.

6. Begin to seat the AGR board. Fold the External GPS wires towards the spindle mounts, and slip the AGR down over the Dial posts. Press the AGR tight against the frame.

7. Start the original Retaining screw into the frame Boss; see pic.

8. Load the Adjustment screw with its spring and brass washer. Slide on the provided #6 Nylon washer. Start the screw into the mating Boss threads. Nudge the Nylon washer away from any electrical components on the AGR. Tighten both it and the Retaining screw.

9. Face up, slide the Dial over the Adjustment screw, and allow it to rest on the frame posts. Align the mounting holes to the frame.




Note: Does the rotor appear centered on the dial? If not, remove the Dial and finely adjust the AGR placement.

10. Screw the two Dial screws (#2-56 x 3/16) in; Press firmly into the screw heads and twist. [Be careful not to over torque the screw and strip the plastic threads].

11. Attach the needle indicator.
    a. The needle should be a snug press-fit on to the rotor. If the needle easily slides onto the rotor and spins freely, do the following…
        i. adhesive is required: Non-permanent *Thread-Locker*, or Nail-polish.
            1. With a Tooth-pick, add a minuscule dab of adhesive, to 'blob' the rotor end. Allow the blob set or get 'tacky' (3-4 minutes); avoid excess that will run down the shaft and inhibit it from turning.
            2. Press the needle on fully and rotate CCW one time.
            3. Remove the needle. Wait another 4 - 5 minutes.
    b. With the needle pointed towards 15 MPH. Partially start the needle onto the rotor shaft.
    c. Rotate the needle CCW until it is centered on 5 MPH.
    d. Press the needle fully onto the shaft. (<u>Allow the adhesive to cure before proceeding!!!</u>.)

12. Clean the Lens and Lens gasket.

13. Place the gasket over the case and dial.
    (Note the correct orientation is pictured in Disassembly step 4.)

14. Slip the Lens over the Adjustment screw, and into place.

15. Slide the Bezel back on.

Your AirGlide Speedometer is READY for Power.

## Electrical Install

1. Return the Speedometer to the Dash. Feed the wires thru the dash front. LEAVE THE SPEEDOMETER LOOSE UNTIL AFTER THE CALIBRATION IS DONE… SO DON'T ATTACH THE MOUNTING BRACKET JUST YET.

2. Provide a source of CLEAN (Noise-free), Key-switched +12Vdc Power. Tap into power that ISN'T directly feeding a Pump, Starter Motor, or etc. Note: This may entail adding a new accessory 18 Awg power wire onto the Key Switch. And possibly upsizing both power wires (Pos and Neg) from the Battery to the dash area.

    a. Bond the Brown wire to Switched Power (+12Vdc).
    b. Bond the Black Wire to Common/GND/Battery Neg. (DO NOT USE the BACKLIGHT COMMON!!)
    c. Remove the Existing Backlight, and bond the Blue Wire to Backlight Power (+12Vdc).

3. Time to Calibrate. (See next Page.)

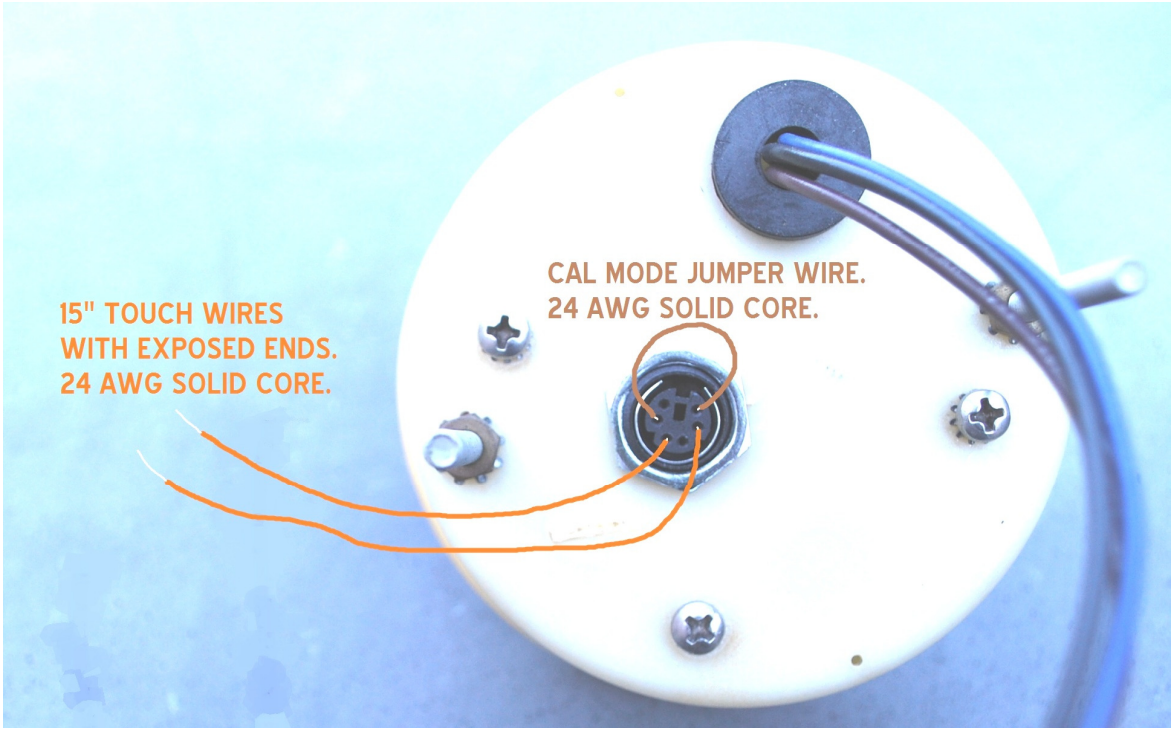
4. Mount the Speedometer after the calibration is successfully accomplished.

5. Note: the internal Backlights are also controlled by the AirGlide. Therefore, the AirGlide must be powered in order for the Backlights to come on. Also as a useful status indicator the Backlights will Flash while the AGR is waiting for a 'satellite-sync'. To witness the flashing, the dash lights must be ON. **This is by design**! For under normal conditions visual feedback from the AirGlide becomes routine and unnecessary. Thus, the user has ability to enable/disable these visible cues by turning the dash lights On or Off. Upon power-up, the AirGlide waits 2 seconds for the power to settle.

PITOT HOSE: REMEMBER TO PLUG/CORK/PINCH-OFF THE HOSE, TO AVOID WATER LEAKING INTO YOUR BOAT!!

## Calibration

A calibration is required to accurately convert reported GPS speeds into needle positions. The procedure is simple and takes two minutes. For best results read the entire procedure first.




1. Confirm the GPS Receiver is unplugged. And the Jumper wires are **correctly** inserted in the PS2 mini circular connector.
2. With the two orange Touch wires in reach, view the Speedometer's face at a close-up.
3. Power-up the gauge.
4. After two seconds the AGR will enter Calibration Mode. If it's not there already, the needle will fall to 5MPH.
5. The needle will slowly increase. When the needle points exactly at **TEN** [10] miles per hour, briefly contact the two Touch Wire (exposed) ends.
6. The needle will jump to approach **FIFTEEN** [15] miles per hour. Again the needle will creep upwards. When it is centered on FIFTEEN, momentarily touch the wires.
7. Continue the jump, approach - center and touch routine for **20, 25, 30, 35, 40,** and **45** miles per hour.
8. **ONLY** after the confirmation 'touch' at the last calibration point will the AGR compute the calibration constants. The calibration constants are saved in non-volatile memory.
9. The needle will reset and automatically retrace most of the calibration steps (over-and-over). The first retrace step will be near TEN [10], and the last at full scale minus 5. No intervention is required... just observe.
10. An accurate retrace indicates the calibration is valid. To redo or replace this calibration, simply turn the power off, wait 10 seconds, and begin again at step 3.
11. Your Calibration is done. Turn the power off. Remove the Jumper wires.

## External GPS Receiver

The compatible GPS Receiver is waterproof with great reception. It is resilient and tolerant to marine surroundings. Following these constraints are key: the GPS requires a clear line-of-sight to the sky; the windshield and cloth top shouldn't present a problem. Keep it away from other electronics / antenna's that may interfere with the receiver. Every boat is different, so experiment with varied Receiver locations to find the best (before mounting it permanently). Route the GPS cable / connector to the back of the dash.

Plug the GPS Receiver into the External GPS connector. Note the 'ARROW' embossed into the connector. Orient the arrow to align with the mating 'pocket' in the female receptacle. Strain-relief the cable to a nearby fixed position.

NOTE: the proper Nautic Laugic Swift GPS Receiver will have an Orange Paint Band on its connector. Only use a Swift GPS Receiver with this Orange Band. Otherwise the AGR, the GPS, and/or the electrical power system may be damaged. Use of any other GPS will void the warranty.


The GPS Receiver is equipped with an internal Status Light.

1. THE LIGHT IS ON: When the Receiver has power.
2. THE LIGHT BLINKS: When the Receiver has a Satellite Sync. This is required for normal operation.

## The GPS Y-Splitter (Option)

The Splitter is applied for dual speedometers. This connects both gauges to a single Swift GPS Receiver. Insert the GPS's connector into the female (receptacle). The male plugs attach to either AirGlide Speedometer; only the 'short' leg provides power to the GPS. Make sure all the connectors have an Orange Band.

## Warranty

Nautic Laugic warranties the AGR for one year.

Should this product malfunction or fail, please return it so we can make it right!! Please see our policies page at www.nauticlaugic.com

**THANK YOU FOR BUYING OUR PRODUCT!!**