GARMIN G1000 ATTITUDE HEADING REFERENCE SYSTEM - ADJUSTMENT/TEST

1. General

A. This section supplies the procedures for the pitch/roll offset calibration, the magnetometer calibration, and the heading offset calibration. If an Attitude Heading Reference System (AHRS) unit is removed and installed again or a new unit installed the procedures that follow must be completed successfully. For a general description of the Garmin G1000 Attitude Heading Reference System, refer to Garmin G1000 Attitude Heading Reference System - Description and Operation.

B. For the removal and installation of the GRS 77/79 AHRS Unit, GRS 77/79 Configuration Module and the GMU 44/44B Magnetometer, refer to Attitude Heading Reference System (AHRS) - Removal and Installation.

2. Troubleshooting

A. For troubleshooting procedures, refer to Garmin G1000 Integrated Avionics System - Troubleshooting.

3. Equipment

NOTE: Equivalent equipment can be substituted for that listed below.

NAME	NUMBER	MANUFACTURER	USE
Digital Inclinometer with Leveling Bars		Commercially Available	For airplane longitudinal and lateral leveling

4. Pitch/Roll Offset Calibration

A. Level the airplane.

(1) Disconnect external electrical power from the airplane.

(2) Make sure that the BATTERY switch (SC005), found on the left circuit breaker switch panel, is set to the OFF position.

(3) Make sure that the EXTERNAL POWER switch (SC006), found on the left circuit breaker switch panel, is set to the OFF position.

(4) Make sure that the AVIONICS 1 (SC016) switch and AVIONICS 2 (SC018) switch, found on the left circuit breaker switch panel, are set to the OFF position.

(5) Do the longitudinal leveling. Refer to Leveling- Maintenance Practices.

(a) Adjust the nose gear jack to make sure that the airplane is at 1.5,° +0.25° to -0.25°, of nose up pitch from level.

(6) Do the lateral leveling. Refer to Leveling- Maintenance Practices.

(a) Adjust the wing jacks to make sure that the airplane is at +0.25° to -0.25° of zero roll.

(7) Check the pitch and roll axis to make sure that they are still in the tolerances that were specified.

(a) If necessary do the applicable step again to make sure that the airplane axis are in the specified tolerance.

B. Apply electrical Power to the Airplane

(1) Apply electrical power to the airplane.

(a) Make sure that the circuit breakers found on the Avionics circuit breaker panel are engaged.

(b) Connect external electrical power to the airplane.

(c) Set the EXTERNAL POWER switch (SC006), found on the left circuit breaker switch panel, to the BUS position.

(d) Set the BATTERY switch (SC005), found on the left circuit breaker switch panel, to the ON position.

(e) Set the AVIONICS 1 (SC016) switch and AVIONICS 2 (SC018) switch, found on the left circuit breaker switch panel, to the ON position.

C. Do the Pitch/Roll Offset Calibration

NOTE: It is recommended that the Pitch/Roll Offset Calibration is done in a hanger. If it is not possible to do the calibration procedures in a hanger, lift the airplane headed in the wind with minimum wind conditions on a level and hard surface. Before the airplane is jacked you must electrically ground it.

(1) When the system is fully initialized push the ENT key on the Multifunctional Display (MFD).

(2) Use the MFD's inner and outer FMS knob to navigate to the AUX-System Status page.

(3) Make sure that the following components shown on the status page have a green check mark next to them indicating correct operation.
- GRS 1
- GRS 2
- GMU 1
- GMU 2.

(4) Disengage the PFD 1, PFD 2, and MFD circuit breakers found on the avionics circuit breaker panel.

(5) Boot the system to configuration mode.
(a) On each display, push and hold the ENT key.
(b) Engage the applicable circuit breaker.
(c) When the display shows Initializing System release the ENT key.

(6) Turn the PFD 1 outer FMS knob to navigate to the AHRS/Air Data page group.

(7) Turn the PFD 1 inner FMS knob to navigate to the GRS/GMU CALIBRATION page.

(8) To get access to the GRS/GMU CALIBRATION page push the softkeys that follow in sequence:
(a) softkey 9
(b) softkey 10
(c) softkey 11
(d) softkey 12.

NOTE: Softkey 12 is the first softkey from the right side of the display.

(9) Push the inner FMS knob to activate the flashing cursor.

(10) Turn the inner FMS knob to select a drop down menu of the two AHRS units.

(11) Turn the knob to select GRS 77/79 # 1.
(a) Push the PFD 1 ENT key.

(12) Turn the FMS Outer knob to highlight the SELECT PROCEDURE field.

(13) Turn the FMS inner knob to select the BEFORE CALIBRATION drop down menu.

(14) Turn the FMS Outer knob to select PITCH/ROLL OFFSET.

(15) Push the ENT key.
(a) Make sure that the PITCH/ROLL OFFSET selection continues to flash.

(16) Push the ENT key again.

(17) When each item on the list shows confirmed push the ENT key.

(18) When the CALIBRATE field flashes push the ENT key to begin the procedure, .

(19) After a few seconds, a new checklist shows at the lower section of PFD 1.

(20) When each item on the list shows confirmed, push the ENT key.

(21) When the CONFIRM AIRCRAFT IS LEVEL field is flashing push the ENT key.

NOTE: The pitch must show 1.5°. Ignore other pitch references in the calibration procedures.

(22) The results of the GRS 77/79 # 1 PITCH/ROLL OFFSET compensation show on the PFD.

(23) If the calibration shows as good on the PFD 1, the AHRS records the required pitch and roll and shows an acknowledgment on the PFD 1 display.

(24) Turn the PFD FMS outer knob to select the SELECT GRS Unit field.

(25) Do the calibration steps again for GRS 77/79 # 2.

D. Remove electrical Power from the Airplane

(1) Set the EXTERNAL POWER switch (SC006), found on the left circuit breaker switch panel, to the OFF position.

(2) Set the BATTERY switch (SC005), found on the left circuit breaker switch panel, to the OFF position.

(3) Set the AVIONICS 1 (SC016) switch and AVIONICS 2 (SC018) switch found on the left circuit breaker switch panel, to the OFF position.

(4) Remove external electrical power from the airplane.

E. Lower the airplane.

(1) Lower the airplane on the jacks. Refer to Leveling- Maintenance Practices.

(2) Remove the jacks from the airplane.

(3) If necessary remove the electrical ground wire.

5. Magnetometer Calibration

NOTE: You must have completed the Pitch/Roll Offset Calibration successfully before you do the magnetometer calibration.

A. Do the Magnetometer Calibration

(1) Taxi the airplane to the compass rose. Refer to approved airplane flight manual.

(2) Use the MFD's inner and outer FMS knob to navigate to the AUX-System Status page.

(3) Make sure that the following components shown on the status page have a green check mark next to them indicating correct operation.

- GRS 1
- GRS 2
- GMU 1
- GMU 2.

(4) Disengage the PFD 1, PFD 2, and MFD circuit breakers found on the avionics circuit breaker panel.

(5) Boot the system to configuration mode.

(a) On each display, push and hold the ENT key.

(b) Engage the applicable circuit breaker.

(c) When the display shows Initializing System release the ENT key.

(6) Turn the PFD 1 outer FMS knob to navigate to the AHRS/AirData page group.

(7) Turn the PFD 1 inner FMS knob to navigate to the GRS/GMU CALIBRATION page.

(8) To get access to the GRS/GMU CALIBRATION page, push the softkeys that follow in sequence:

(a) softkey 9

(b) softkey 10

(c) softkey 11

(d) softkey 12.

NOTE: Softkey 12 is the first softkey from the right side of the display.

(9) Push the inner FMS knob to activate the flashing cursor.

(10) Turn the inner FMS knob to select a pull down menu of the two AHRS units. Turn the knob to select GRS 77/79 # 1.

(a) Push the PFD 1 ENT key.

(11) Turn the FMS outer knob to select the SELECT PROCEDURE field.

(12) Turn the FMS inner knob to select a BEFORE CALIBRATION drop down menu.

(13) Turn the FMS outer knob to select MAGNETOMETER.

(14) Push the ENT key on the BEFORE CALIBRATION drop down menu when each step shows completed.

(15) When the CALIBRATE field flashed push the ENT key to begin the procedure.

(16) The PFD shows instructions to position the airplane at 000° +5.0° to -5.0°.

(17) The PFD shows a timer that counts down 18 seconds.

(18) After the 18 second count the PFD gives instructions to turn right until a HOLD POSITION message shows on the PFD.

NOTE: For magnetometer #1 you must turn the airplane to the left. Ignore the PFD statement to turn right. For magnetometer #2 you must turn right as the PFD display shows.

(19) Do the instructions on the PFD display until a complete circle is completed.

(a) The PFD shows the calibration is completed successfully.

NOTE: The airplane must be turned smoothly. If the time to turn the airplane exceeds the time allowed by the program the PFD can show the HOLD POSITION message when the airplane is not at the correct heading. If this occurs turn the airplane to the correct heading and continue the calibration.

NOTE: If high winds are buffeting the airplane timer restarts can occur. If the number of restarts exceeds the number allowed the calibration fails and the PFD shows the TOO MANY STATONS message.

(20) Push the ENT to acknowledge the calibration is completed.

(21) Turn the outer FMS knob to highlight the SELECT GRS UNIT window.

(22) Push the inner FMS knob to activate the flashing cursor.

(23) Turn the inner FMS knob to select a pull down menu of the two AHRS units. Turn the knob to select GRS 77/79 # 2.

(a) Push the PFD 1 ENT key.

(24) Do the calibration procedures again for magnetometer # 2.

(25) Taxi the airplane to the assigned parking ramp space. Refer to approved airplane flight manual.

6. Heading Offset Calibration

NOTE: It is necessary to do this procedure only if after you calibrate each of the two AHRS, a difference of 1° or more shows between PFD 1 and PFD 2.

A. Do the Heading Offset Calibration

(1) Taxi the airplane to the compass rose. Refer to approved airplane flight manual.

(2) On PFD 1, navigate to the GRS/GMU CALIBRATION page. In this section refer to Do the Pitch/Roll Offset Calibration.

(3) Use the FMS inner and select GRS 77/79 #1 from the drop down menu.

(a) Push the ENT key to confirm selection.

(4) Turn the FMS Outer knob to highlight the SELECT PROCEDURE field.

(5) Turn the inner knob to select the HEADING OFFSET procedure.

(a) Push the ENT key to confirm selection.

(6) When each item on the list shows confirmed push the ENT key.

(7) When the CALIBRATION field is flashing push the ENT key to start the procedure.

(8) PFD 1 shows a message to turn the airplane to a cardinal heading.

(a) Push the ENT key to confirm airplane is aligned

(9) When the CONFIRM Heading indication flashes, the airplane is aligned to the corresponding cardinal heading.

(10) Turn the airplane to each of the cardinal headings and confirm airplane alignment when applicable.

(11) When the offset calibration is complete push the ENT key to confirm.

(12) Taxi the airplane to the assigned parking ramp space. Refer to approved airplane flight manual.