SERVICE MANUAL

AND

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

FOR

AEROCET GC600 GEAR ADVISORY

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LOG OF REVISIONS PAGE

REV.	PAGES AFFECT.	DESCRIPTION	DATE	APPROVED
00	ALL	Initial Release	8/17/09	TH
01	ALL	Added "TEST" button audible announcement function in Section 2.2 Audio, and Section 3.8 Inspection, Scheduled, "Preflight"	2/18/10	TH
02	20	Added new Detected Problem, to 4.1 Troubleshooting table, @ audible section, "Audio Warning repeats "Gear Unsafe…", including Possible Causes and Corrective Actions for same.	3/03/11	[signature]
	21	Edited text, IS: The Gear Advisory unit is a sealed unit and should be returned to Aerocet, Inc. for any servicing. WAS: The Gear Advisory unit is a sealed unit and should be returned to Aerocet, Inc. for any servicing. Aerocet, Inc. endeavors to have exchange units available to minimize down time.		

Table of Contents

SECTION 1. Introduction

This Component Maintenance Manual (CMM) and instructions for Continued Airworthiness (ICA) contains the maintenance instructions to install, maintain, inspect and repair Aerocet GC600 Gear Advisory assembly, and its general application to a variety of amphibious aircraft. This document does not contain complete maintenance information necessary to keep the airworthiness of the entire aircraft, but addresses to the extent reasonable such aspects pertaining to the gear advisory alone. This document is intended to be kept intact.

Thank you for purchasing the Aerocet GC600 Gear advisory. Built to operate at multiple system voltages and accommodate a variety of approach speeds and settings, the GC600 is both lightweight and durable, and designed to last the lifetime of your float and gear systems.

1.1 How to use this Supplemental Manual

Used in conjunction with the airplane Owner's Manual and Illustrated Parts Catalog, this supplemental manual provides the installer and the operator with a source of information for installing, removing and operating the Aerocet GC600 Gear Advisory.

This manual is organized as follows:

Operating Information. Instructions and information regarding the indicator lights and audio, as well as adjustment instructions.

Service and Maintenance Information contains necessary information for proper handling, recommended inspections, troubleshooting, removal and electrical overviews.

1.2 Warnings, Cautions and Notes

Certain information pertaining to specific operations is posted in relevant areas and should be carefully regarded as follows:

WARNING

An operating procedure, inspection, repair or maintenance practice, which if not correctly followed, could result in personal injury, or loss of life.

CAUTION

An operating procedure, inspection, repair or maintenance practice, which if not strictly observed, could result in damage or destruction of equipment.

NOTE

An operating procedure, practice or condition, etc., which is deemed essential to highlight.

Units of Measure. The customary linear unit used in this document is the Decimal inch, unless otherwise specified, as applicable.

1.3 Availability

One complete hard (paper) copy of this manual shall be provided with each new GC600 Gear Advisory. Additional copies and minor revisions shall be available via email, U.S.P.S (mail), UPS or FedEx by request. Fees and delivery charges may apply.

Notification of any changes that require service for airworthiness shall be distributed to all applicable Aerocet owners on record with Aerocet, Inc. In such a case, copies of the applicable, revised portions of this manual shall be provided.

Aerocet, Inc. maintains record of purchasers and/or owners, collected at the time of purchase in order to comply with the above, as well as to maintain a high standard of service. If you have moved since your original purchase, have purchased a used product or otherwise have reason to believe that the contact information on file is incorrect, please provide the following information to Aerocet, Inc: (Aerocet contact information is on the front of this document.)

Gear Advisory information:

Unit model_____

Unit S/N (R/L)_____

Aircraft Information:

Aircraft Make/Model_____

Aircraft Registration_____

Aircraft S/N_____

Other Information: (as applicable)

Previous Owner_____

Previous Address_____

Present Owner_____

Present Address_____

Present Phone Number_____

Present E-mail Address_____

1.4 Description

The GC600 Gear Advisory is a reliable, audio and visual confirmation of nose and main gear positions. Compact and lightweight, the GC600 is airspeed adjustable and multi-voltage compatible, designed to operate on a wide variety of aircraft.

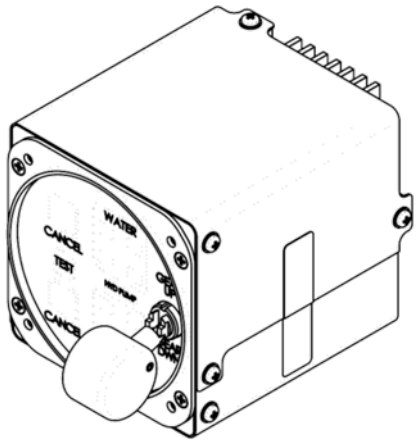

Figure 1.4.1

GC600 Gear Advisory

Aerocet is committed to safe and trouble free operation of the GC600 gear advisory unit. Developed to be virtually free of operator maintenance and adjustment. Any internal repairs or troubleshooting of the unit, shall be accomplished by Aerocet, Inc.

1.5 Dimensions, Locations and Nomenclature

The Aerocet GC600 Gear Advisory Housing measures 3.22 X 3.23 X 4.07 deep, and weighs approximately 12.8 oz. The unit fits in an un-used instrument cut-out, designed for a standard 3-⅛" diameter bezel face. Fastened with 4 ea. 6-32 UNC screws, with a maximum fastener penetration into box of ½", on a 2.47 square hole pattern. The GC600 operates on 10-30 volts DC, and is protected with an in-line 1 amp fuse and 2, 1 amp breakers. Static and Pitot systems are fed to the back of the unit via ¼" x .050 wall, semi-rigid nylon tubing. (See section 3 for complete installation specifications).

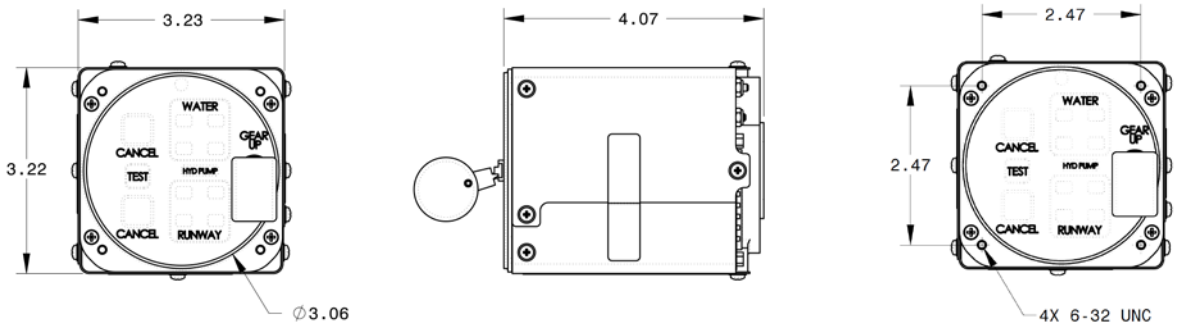

Figure 1.5.1

Housing and Mounting Hole Dimensions

SECTION 2. Operating Information

2.1 Lights

Translucent blue lights indicate individual gear in the fully up position, (water landing). Upper two lights represent the nose gear, lower two lights represent the main gear.

Translucent amber lights indicate individual gear in the fully down position, (runway landing). Upper two lights represent the nose gear, lower two lights represent the main gear.

When the gear selector main switch is moved from “GEAR UP” or “GEAR DOWN” positions, the “HYD PUMP” light will illuminate red. This light indicates that the hydraulic pump is on and that the gear is in transition. The blue and amber individual gear lights will temporarily go out, as each gear leaves its position, or on as each gear reaches its full travel destination.

The backlight intensity is controlled by the photo sensor located in the upper center of the unit front face. The intensity is automatically controlled by the ambient light intensity. Brightness is enhanced during daylight for better visibility and reduced for night light viewing.

The “TEST” button in the center left position of the face illuminates all lighting on the unit to verify proper operation at each position. Intensity of lights may vary when the “TEST” button is depressed, but is indication that all lights are functioning.

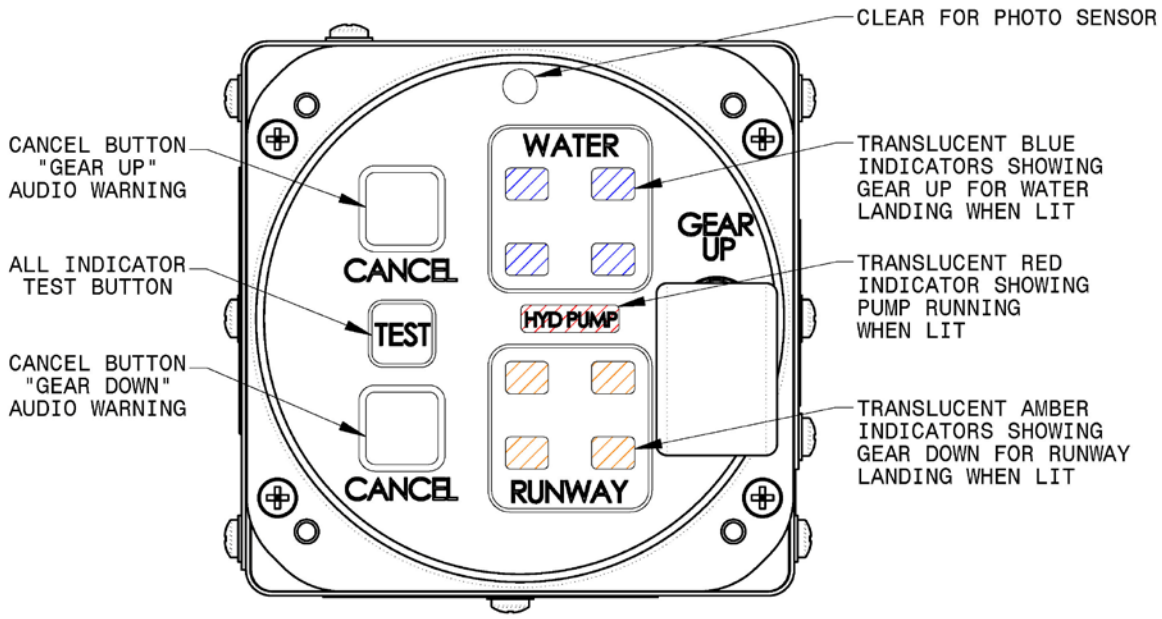

Figure 2.1.1

Indicator Light Pattern, Display face

2.2 Audio

The GC600 audio announcements are dependent on airspeed “ARM” and “TRIGGER” settings, which are factory pre-set for the aircraft type. The GC600 is armed by the aircraft exceeding the pre-set airspeed. As the aircraft begins its approach, it slows its airspeed passing through the pre-set trigger speed, and sounding an audio announcement to indicate the gear position. If the gear is not in a fully retracted or a fully deployed position, then a gear unsafe announcement will sound.

With all blue lights on, the announcement will sound, “Water landing, gear is up for water landing”. This announcement will continue to repeat and complete the phrase, until the upper “CANCEL” button is pushed, or the aircraft speed is increased above the trigger airspeed setting.

With all amber lights on, the announcement will sound, “Runway landing, gear is down for runway landing”. This announcement will continue to repeat and complete the phrase, until the lower “CANCEL” button is pushed, or the aircraft speed is increased above the trigger airspeed setting.

If the condition exists where any indicator light within the WATER quadrant, or RUNWAY quadrant, fails to illuminate, then the announcement will sound, “Gear is unsafe, check gear”. This announcement will continue to repeat and complete the phrase, until either upper or lower Cancel button is pushed to de-activate.

The “TEST” button in the center left position of the face, when depressed, will sound an audible announcement indicating the current position of the gear. One of three announcements listed above, will repeat as long as the button is depressed. This announcement will continue to repeat and complete the phrase, until the button is released.

2.3 Settings

On the bottom side of the housing, a label is located over two access slots, concealing six potentiometers. Pull back the label to access these pots and change settings with a .04 slotted screwdriver. Turning the pots clockwise increases the value or counter-clockwise to decrease value. All adjustments are initially made at Aerocet, Inc. Adjustment pots 1, 2, 3 and 6 are user adjustable. **Adjustment pots 4 and 5 are factory set; user accepts liability for altering these settings.**

The functions for these pots are as follows:

#1 – ***Low Light Adjustment,*** sets light level for night viewing. Adjust pot in dark environment or cover the photo sensor to simulate night time flying. Note; when altering low light adjustment, it is necessary to re-adjust high light adjustment setting, #2.

#2 – ***High Light Adjustment***, sets light level for bright day time viewing. Adjust pot in daylight environment to simulate day time flying. Note; when altering high light adjustment, it is necessary to re-adjust low light adjustment setting, #1.

#3 – ***Voice Volume Adjustment***, sets audio level for all gear advisory announcements. Used in conjunction with the aircraft audio system.

#4 – ***Trigger Adjustment***, factory setting; When the aircraft passes below a set air speed, one of three audible announcements will sound.

#5 – ***Arm Adjustment***, factory setting; When the aircraft passes above a set air speed, the unit is armed and ready for automatic audible operation.

#6 – ***Voice Pitch Adjustment***, sets rate that voice announcements are delivered. Adjust this pot until a comfortable and natural voice delivery is achieved.

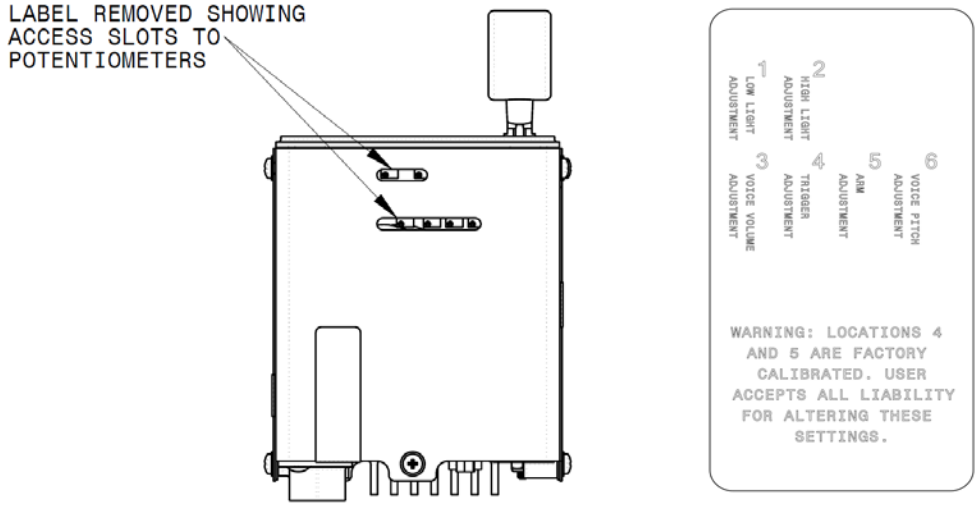

Figure 2.3.1

Housing bottom view with label removed,
and enlarged view of Setting Adjustment Label

SECTION 3. Service and Maintenance Information

3.1 Handling of Components

Any unit containing electronic components, such as transistors, diodes, integrated circuits, proms, roms, and memory devices are subject to damage by electrostatic discharges (ESD), and should be protected from static discharge.

CAUTION

To prevent damage from electrostatic discharge, observe standard procedures for handling equipment containing electrostatic sensitive devices or assemblies, in accordance with the recommendations and procedures set forth by the electronics industry.

Care should be taken by the technician to properly ground the electrical system of the aircraft and himself to a common point ground. The ESD wrist strap properly connected, is the preferred method of dissipating static charge when handling sensitive instruments and equipment.
Maintain a clutter free work space and avoid conductive materials in, and around the work area. Avoid touching unconnected contacts and leads that can carry static charges through the unit and damage sensitive components within.

3.2 Installation

3.3 Air Line connections

Connect the Gear Advisory unit to respective static and pitot systems using the following Nylo-Seal fittings:

268-N 04 x 02 ¼" Tube to ⅛" NPT fitting (2X)
264-N 04 Union Tee (2X)
44-NSR ¼" Semi-Rigid Nylo-Seal Tubing
Or Substitute with:

Parker Paraflex NR-4-050 or
Parker NNR-4-050 (natural) or NBR-4-050 (black)
And with other Nylon 11, ¼ O.D. x .050 wall semi-rigid tubing, suitable for use with compression style the thermoplastic fittings

Static pressure systems must be tested after installation of Gear Advisory
See 14 CFR 91.411

It may be helpful to mark (color code) the static and pitot tube lines with permanent marker so that they are easier to differentiate during installation.

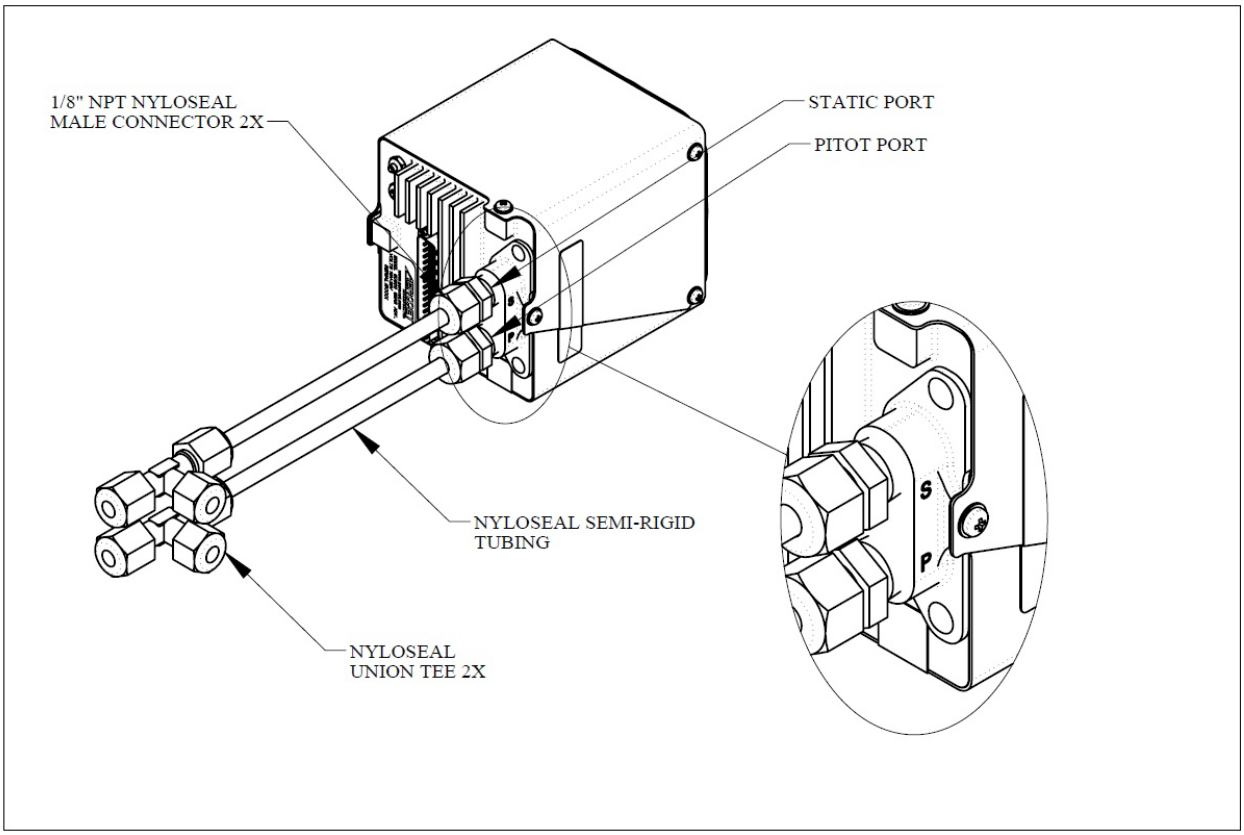

Figure 3.3.1

Tube connections to Static and Pitot systems

3.4 Electrical Connections

Figures **3.4.1.** and **3.4.2.** show the intended arrangements for the GC600 as installed with Aerocet Model 3400 floats as an overview. Use Aerocet Drawings 35A-46010 <Float Schematic> and 35A-60015 <Installation Schematic> for detailed specifics. Other applications must match this arrangement in order to implement the GC600 correctly.

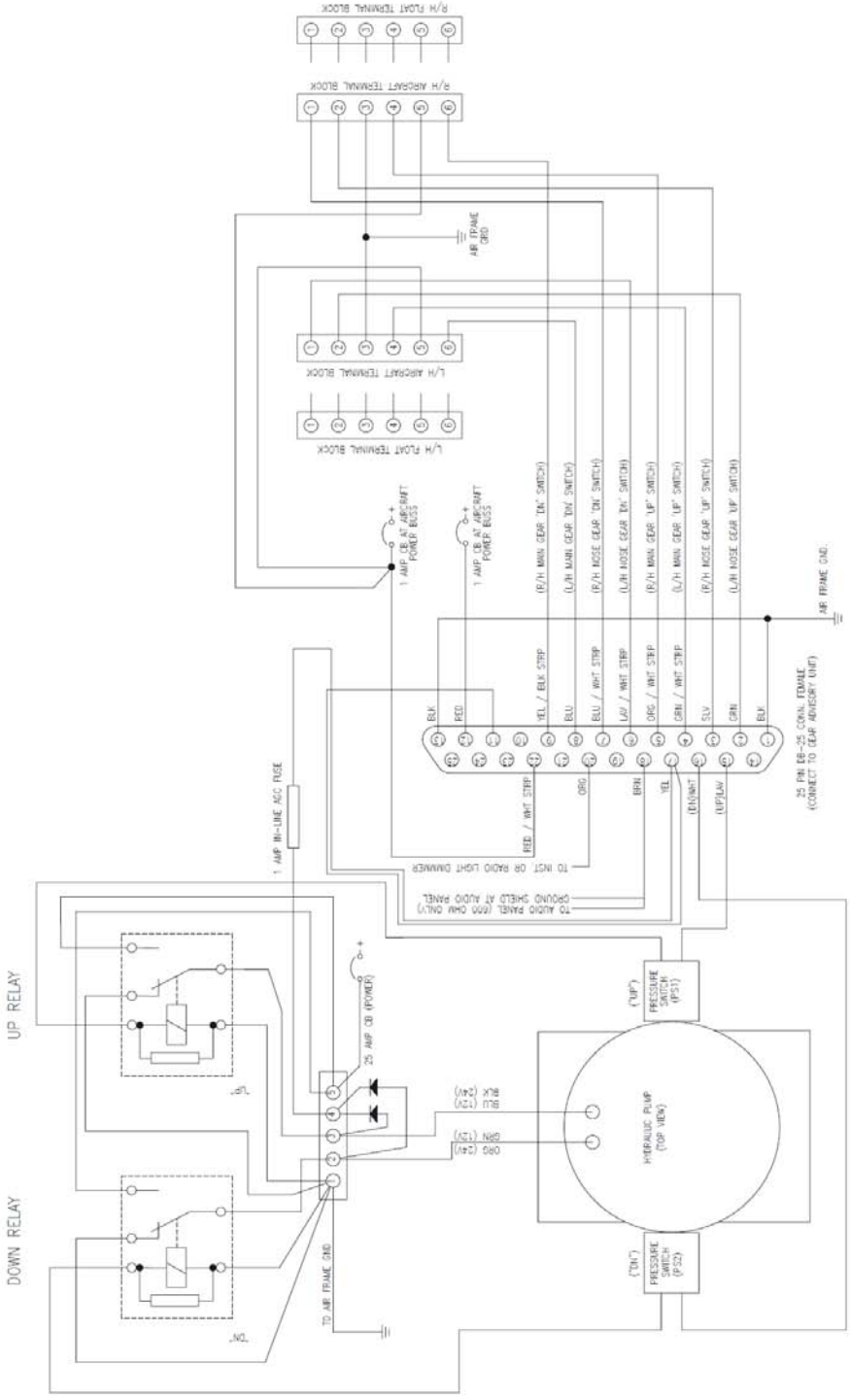

Figure 3.4.1

General wiring schematic and harness connector
Pin layout

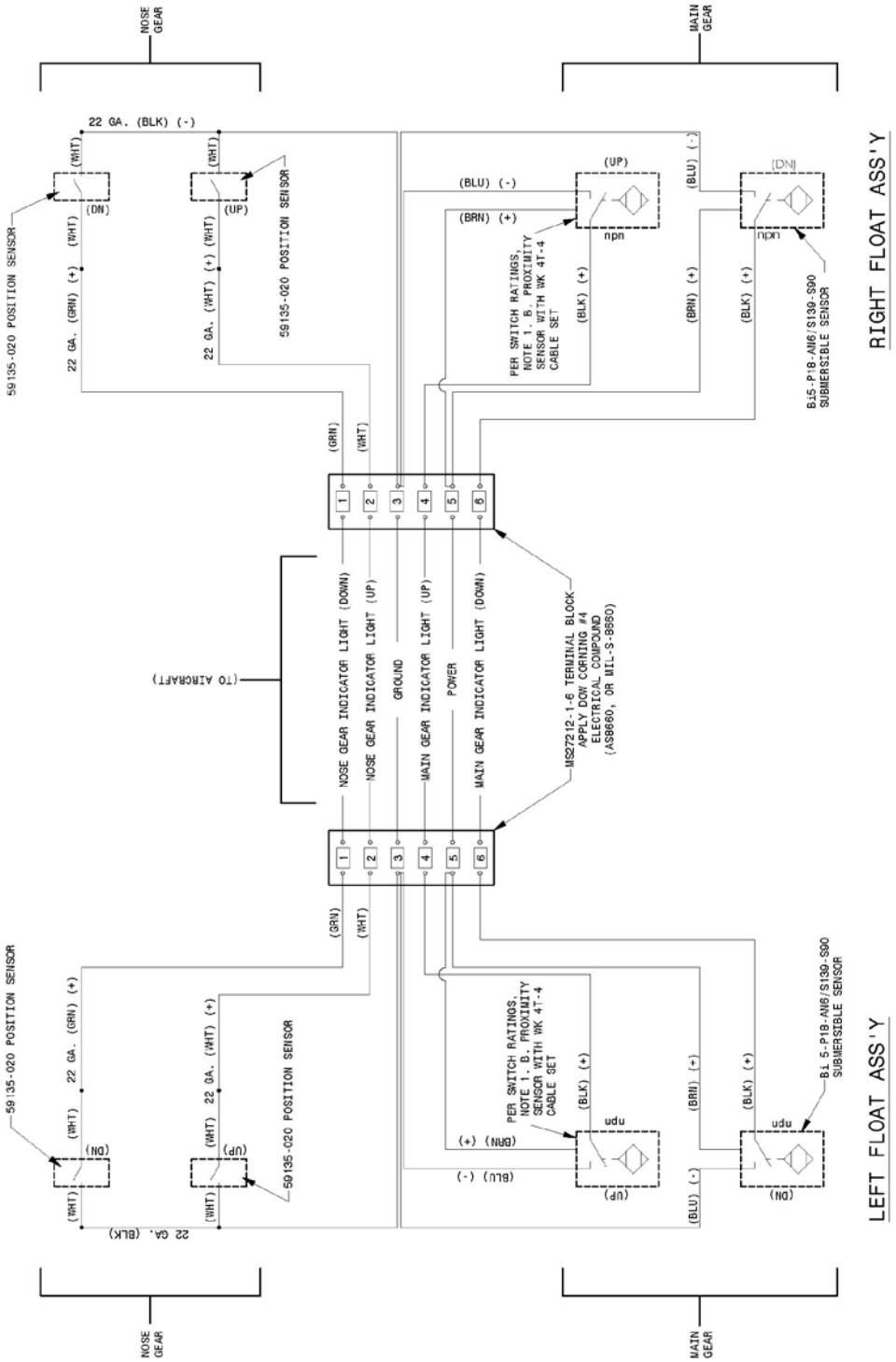

Figure 3.4.2

General wiring schematic for Float and Sensor layout

3.5 Instrument panel Installation

The unit fits in an un-used instrument cut-out. Designed for a standard 3-⅛" diameter bezel face. Determine the fastener length for 4 ea. 6-32 UNC screws by adding the thickness of the control panel with ½ inch maximum screw protrusion through the mounting screw hole pattern.

CAUTION

Do not allow greater than ½ Inch of protrusion of the 6-32 UNC fasteners, through the front face of the gear advisory unit. Round down to the next available screw size, when necessary. If not strictly observed, damage of the unit could occur.

3.6 Product Listings

LPS® Electrical Contact Cleaner, for connectors, or equivalent. Use a fast drying, multi-purpose industrial cleaner which evaporates quickly without a residue.

LOCTITE® 222 Thread Locker, (blue), for small mounting fasteners, or Permatex equivalent. Use a medium strength thread locker capable of withstanding vibration.

GC ELECTRONICS® Silicone Z9, or Type I (silicone) or Type II (non-Silicone) or equivalents, for sealing electrical joints and connectors.

3.7 Fastener Torque

Small Diameter screws should be tightened approximately ¼ turn past run-up of the assembly. Brass and aluminum screws are easily stripped, so care should be exercised not to over-torque.

Nylon 1/8-27 Adapter fittings should be tightened 2 turns past run-up. If fitting is removed and re-installed, Teflon tape or pipe dope should be applied to threads and tightened as listed above. Do not apply Teflon tape or pipe dope to the extreme ends of fittings to avoid fouling system.

3.8 Inspections, Scheduled

A. Preflight:

Conduct Preflight inspections according to the existing aircraft owner's manual and add the following to the Instrumentation group.

1. Depress "TEST" button to confirm that all position LED's are functioning properly. Note, light intensity may vary but is indication that all lights are functioning. Verify that an audible announcement sounds, indicating current gear position.

B. Daily:

Conduct Daily inspections according to the existing aircraft owner's manual.

C. Periodic:

Conduct Periodic inspections according to the existing aircraft owners' manual and add the following to the Instrumentation group.

1. Static system; Test must comply with the static system tests required by 14 CFR 91.411 and be performed by an appropriately-rated repair station with the appropriate test equipment.
2. Pitot system; Test in accordance with the aircraft manufacturer's instructions.

3.9 Inspections, Un-Scheduled

1. Lights, audio malfunctions or unexpected behavior should be investigated.
2. Anytime that the aircraft's electrical components such as generators, alternators or batteries have been replaced. Verify current, voltages and function.
3. Following incidents which induce abnormal mechanical loads to airframe.
4. Following lightening strikes. Verify current, voltages and function.

SECTION 4. Troubleshooting

Table 4.1 Troubleshooting Model GC600 Gear Advisory		
Lights		
Detected Problem	**Possible Causes**	**Corrective Action**
Gear Lights do not illuminate at all when TEST Button is depressed.	Power supply is not connected, or is inadequate.	Ensure proper battery, power buss and hook ups according to appropriate Maintenance Manual(s).
		Check for broken connections, proper hook up according to installation schematic.
		Refer to "ring-out" procedures in this manual for the DB-25 connector.
Gear Lights do not illuminate with equal intensity during operation.	Internal components are compromised.	Return the GC600 unit to Aerocet, Inc. for repair.
Light intensity is either too bright or too dim for daytime or nighttime visibility.	Factory presets are not desirable.	Refer to Section 2.3 of this manual to obtain desired settings.
Light intensity does not adjust for daytime or nighttime conditions.	Photo sensor is obstructed.	Remove obstruction.
	Interior light source, such as a flashlight or an overhead light, is causing the photo sensor to get a false reading.	Turn off the light source, or change its target. (Light intensity should adjust immediately.)
	Internal components are compromised.	Return the GC600 unit to Aerocet, Inc. for repair.
Nose or Main Gear Lights do not illuminate when the gear are fully positioned.	Gear Sensors are incorrectly installed, mis-wired or malfunctioning.	Check the position sensors according to the applicable schematic, maintenance

Table 4.1 Troubleshooting Model GC600 Gear Advisory

Lights

Detected Problem	Possible Causes	Corrective Action
		manuals, etc.
		Check the wiring for corrosion, poor connections or damage.
		Check all wire grounds.
	Internal components are compromised.	Return the GC600 unit to Aerocet, Inc. for repair.
Hydraulic Pump Light does not illuminate when TEST button is depressed.	Power supply is not connected, or is inadequate.	Ensure proper battery, power buss and hook ups according to appropriate Maintenance Manual(s).
		Check for broken connections, proper hook up according to installation schematic.
		Refer to "ring-out" procedures in this manual for the DB-25 connector.
	Internal components are compromised.	Return the GC600 unit to Aerocet, Inc. for repair.
Hydraulic Pump Light does not illuminate while the hydraulic pump is actually running.	Hook up wiring or diodes may be compromised.	Check for broken connections, proper hook up according to installation schematic.

Table 4.1 Troubleshooting Model GC600 Gear Advisory

Hydraulic Pump

Detected Problem	Possible Causes	Corrective Action
Hydraulic Pump does not activate when the position switch is thrown.	Power supply is not connected, or is inadequate.	Ensure proper battery, power buss and hook ups according to appropriate Maintenance Manual(s).
		Check circuit breakers whether blown or pulled. If blown investigate wiring further.
		Refer to "ring-out" procedures of this manual for the DB-25 Connector.
	Hook up wiring is compromised.	Check for broken connections, proper hook up according to installation schematic.
	Pressure Switches are "open" from hydraulic lock.	Refer to Amphibian Float service Manual for corrective action.
	Malfunctioning Relays in Pump installation.	Check Hydraulic Pump Relays according to appropriate maintenance manual.
	Internal components are compromised.	Return the GC600 unit to Aerocet, Inc. for repair.
Hydraulic Pump activates in the reverse - ex. Selecting Up with the position switch results in Gear deploying.	Hydraulic lines are reversed.	Check installation to appropriate drawings.
	Hydraulic Pump is wired incorrectly.	Check for proper hook up according to the installation schematic.
	Internal components are compromised.	Return the GC600 unit to Aerocet, Inc. for repair.
Hydraulic Pump runs noticeably slow.	Low voltage supplied to the hydraulic pump.	Check for faults with installation wiring. This includes corrosion, damaged insulation or improper hook up. Ref installation schematic and maintenance manual.
		Check battery voltage and condition. Refer to aircraft maintenance manual.
		Check voltage at the aircraft buss connection.
		Check voltage at the terminal block near the hydraulic pump.
		Check gear and hydraulic systems for mechanical damage, debris or other obstructions according to the applicable maintenance manual.

Table 4.1 Troubleshooting Model GC600 Gear Advisory		
Circuit Breakers		
Detected Problem	**Possible Causes**	**Corrective Action**
1 amp Circuit Breaker on bus bar opens.	Hook up wiring is compromised. (CB for internal relays only)	Check for faults with installation wiring. This includes corrosion, damaged insulation or improper hook up. Ref installation schematic and maintenance manual.
	Internal components are compromised. (CB for electronics only)	Return the GC600 unit to Aerocet, Inc. for repair.

Table 4.1 Troubleshooting Model GC600 Gear Advisory		
Audio		
Detected Problem	**Possible Causes**	**Corrective Action**
Audio Warning does not activate.	Volume is too low, or audio wiring is incorrectly installed.	Check Aircraft Audio Panel settings and hook up.
	Static or Pitot system is compromised.	Have a qualified technician check the Static and Pitot systems.
	Internal components are compromised.	Return the GC600 unit to Aerocet, Inc. for repair.
	Trigger Speed is not correctly set.	Refer to Section 2.3 of this manual to obtain desired settings.*
Audio Warning does not activate after a "Go Around"	Airspeed did not exceed the "Arm" speed.	Increase airspeed during the downwind leg of a "Go Around" procedure.
	The "Arm" speed setting is too high.	Refer to Section 2.3 of this manual to obtain desired settings.*
Audio Warnings continue to activate.	Incorrect Cancel Button is being depressed.	Depress the cancel button for the operation. e.g. the upper Cancel Button for cancelling the "Gear is UP…" warning.
Audio Warnings continually reactivate while flying "in the pattern" after depressing the correct cancel button.	Airspeed is too close to "Arm" and "Trigger" speeds.	Maintain slightly higher speeds.

Table 4.1 Troubleshooting Model GC600 Gear Advisory

Audio

Detected Problem	Possible Causes	Corrective Action
	The "Arm" and "Trigger" speed settings are too high. e.g. the aircraft is hovering near the Arm and Trigger speeds, re-arming the unit and triggering it again during pattern work.	Refer to Section 2.3 of this manual to obtain desired settings.*
Audio Warning repeats “Gear Unsafe, Check Gear”, although Nose and Main gear lights may be illuminated and gear is fully positioned.	Hook up wiring is compromised.	Check for faults with installation wiring. This includes corrosion, damaged insulation, loose or corroded terminal lugs and ground contacts.
	Gear Sensors are incorrectly installed, mis-wired or malfunctioning.	Check the position sensors for damage and adjustment, according to the applicable schematic, maintenance manuals, etc.
Audio Volume is too low.	Aircraft Panel Adjustments are incorrect or have been inadvertently lowered.	Adjust the panel settings according to the appropriate Maintenance Manual or Pilot Operation Handbook or Flight Manual.
	Aircraft Power is low.	Refer to Aircraft Maintenance Manual to ensure adequate current and power storage.
		Check, recharge or replace the battery. Refer to Section 7 of this manual for GC600 Ratings.
	Factory presets are not desirable.	Refer to Section 2.3 of this manual to obtain desired settings.
Audio Volume is too high.	Aircraft Panel Adjustments are incorrect or have been inadvertently raised.	Adjust the panel settings according to the appropriate Maintenance Manual or Pilot Operation Handbook or Flight Manual.
	Factory presets are not desirable.	Refer to Section 2.3 of this manual to obtain desired settings.
Speech in the audio is too fast or slow.	Settings have been changed.	Refer to Section 2.3 of this manual to obtain desired settings.
	Factory presets are not desirable.	

Table 4.1 Troubleshooting Model GC600 Gear Advisory		
Audio		
Detected Problem	**Possible Causes**	**Corrective Action**
Speech is garbled during normal flight procedures.	Hook up wiring is compromised.	Check for faults with installation wiring. This includes corrosion, damaged insulation or improper hook up. Ref installation schematic and maintenance manual.
	Internal components are compromised.	Return the GC600 unit to Aerocet, Inc. for repair.

*Arm and Trigger Settings are factory set. User accepts all liability for altering these settings.
**Opening of the GC600 case for any reason will void any warranty.

The Gear Advisory unit is a sealed unit and should be returned to Aerocet, Inc. for any servicing.

SECTION 5. Removing and Replacing Product

1. Locate installed GC600 unit and clear work area in cabin of all unnecessary obstructions.
2. Disconnect Static and Pitot lines from back of unit. Mark lines with permanent marker. Tapes left in place may be a hazard.
3. Disconnect DB-25 Connector from the back of unit.
4. Remove brass machine screws from the front face of unit through the aircraft instrument panel. Remove from behind panel.
5. Installation is reverse of 5.1 thru 5.4
6. Static pressure system must be tested by a qualified technician with proper equipment.

   (14 CFR 91.411), 14 CFR 43 App. E. pp A.

SECTION 6. Special Tools Required

- Standard .04 slotted, jewelers' screwdriver.
- Phillips # P0 screwdriver
- Phillips # P1 screwdriver
- 7/16" SAE open end wrench

SECTION 7. Electrical Loads Applicable

GC600 operates at 10 to 30 volts DC, >1 amp.

7.1 Electrical "Ring out" Test

Before the GC600 Gear Advisory unit is connected, check voltages with a digital volt meter to insure that the proper voltages are present. For 12 volt systems, (+12 to 14 VDC) and for 24 volt systems, (+24 to 28

VDC), at power pins 12 and 22 of the 25 pin connector, relative to the aircraft ground. Also, check voltages at the terminal blocks located within the floats, at pin 5 for similar readings.

With the same digital meter set to OHMS, check pins 1 and 13 of the 25 pin connector, to ensure that they are less than .5 ohms to aircraft ground. Also, check at the terminal blocks located within the floats, at pin 3 for similar readings.

SECTION 8. Airworthiness Limitations

8.1 General

The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under §§43.16 and 91.403 of the Federal Aviation Regulations unless an alternate program has been FAA approved.

8.2 Description

1. Time Limited Items;

   None

2. Required Inspections Interval;

   None

3. Scheduled Maintenance;

   For Aerocet recommended Inspection or Replacement, see Section 3