

INSTRUCTIONS for CONTINUED AIRWORTHINESS

GDC31 Roll Steering Converter

1049-2170-02

REV B

RELEASED

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LIST OF EFFECTIVE PAGES

When updated, this document is changed in its entirety.

A current revision of this ICA is available on the DAC website at <http://www.dacint.com/dacecd.htm>
(Technical Data section).

1. INTRODUCTION

This procedure provides instructions for the continued airworthiness of the GDC31 Roll Steering Converter.

1.1 Scope

This document identifies the Instructions for Continued Airworthiness (ICA) for the modification of aircraft under the above referenced STC and accompanying Approved Model List (AML). Appendixes B through G provide wiring and equipment location drawings for aircraft models Cessna T210M, Piper PA46-310P Malibu and Beech 58P Baron. Appendix A provides an equipment location form and generic wiring diagram for use in follow-on approvals of the GDC31 Roll Steering Converter into aircraft listed on the AML.

1.2 Follow-On Installations

Reference Approved Model List of DAC International STC SA10236SC. Complete the data in Appendix A for follow-on installations into aircraft on the AML.

1.2.1 Equipment Location

Refer to the block diagram in section 2 of this document.

The AP/SEL switch is located near the autopilot control panel or near the HSI, in the pilot's primary field of view and easily accessible by the pilot.

The GDC31 Roll Steering Converter can mount in the avionics bay, shelf or other suitable structure. It can be mounted in any orientation. Refer to the data in Appendix A through G for specific location details. Also refer to the Equipment Installation manual, 1049-2510-01, for additional details and equipment limitations regarding equipment location.

1.2.2 Wire Routing

Route wires along existing wire bundles where practical. For installations where the GDC31 RSC is not located behind the instrument panel, describe the wire routing details using the form in Appendix A.

1.2.3 Mounting

For mounting the annunciator switch, refer to the Equipment Installation manual, 1049-2510-01, for details regarding panel cutout.

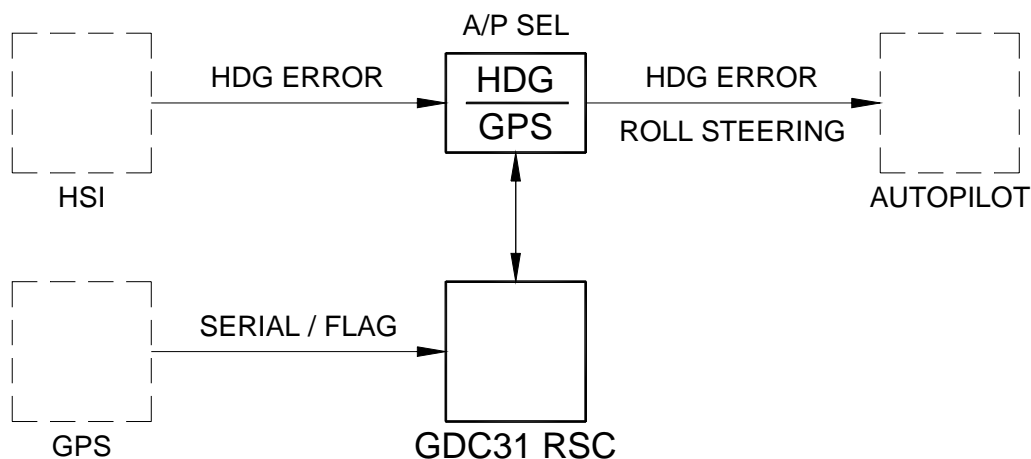
Mount the GDC31 RSC using four sets of #8 hardware described in section 4 of this ICA. MS or AN locking nut plates may be substituted for nuts and lock washers.

2. DESCRIPTION

The GDC31 Roll Steering Converter is designed to receive RS232 or RS422 serial data from a GPS Navigation System to produce both an analog Roll Sum Steering (RSS) signal and ARINC 429 labels bank angle command and ground speed.

The GDC31 output signal connects to the heading error input of the aircraft's existing autopilot. The GDC31 mimics the heading error signal of the aircraft's installed HSI or DG. The GDC31 does not reduce or otherwise alter any existing safety features of the autopilot, such as bank limiting, rate limiting and protection from a hard over. The GDC31 provides lateral (roll) data only (no pitch data is supplied by the GDC31). The ARINC 429 output can drive digital autopilots or converters.

The pilot selects between existing heading mode or GPS mode using a switch / annunciator. In heading mode, the autopilot operates as always, tracking the heading bug. In GPS mode, the GDC31 output signal supplies the autopilot's heading channel. The GDC31 calculates the correct course intercept angle from data supplied by the GPS to guide the aircraft onto course then maintain that course.



Block Diagram

(Dashed items represent existing aircraft equipment)

3. OPERATION

3.1 Control

The GDC31 provides conversion of Serial data from a GPS receiver into a steering signal connected to the autopilot heading channel through switching controlled by the HDG/GPS mode selector switch. There are no other operator controls associated with the GDC31 unit.

3.2 Equipment Checkout

The GPS receiver and the Autopilot must both be operational in order to perform this ground functional checkout.

1. Insure that all control surfaces are clear and that the control wheel is centered in roll.
2. Apply power to the GPS Receiver and Autopilot.
3. Set the HDG/GPS Mode selector to HDG.
4. On the HSI, center the heading bug.
5. Engage the autopilot in Heading Mode.
6. Operate the heading bug, observe that the control wheel turns left and right in response to the heading bug operation.
7. Center the control wheel using the heading bug.
8. Place the HDG/GPS Mode selector in the GPS position. For installations using an ARINC 429 data source, the GPS annunciator blinks until ground speed is greater than 40 knots. For installations using and RS232 data source, observe GPS illuminates and is not blinking.
9. Verify that the control wheel remains centered (very slow displacement is acceptable).
10. Disengage the autopilot.
11. Ground test complete. Secure aircraft power.

4. SERVICING INFORMATION

All servicing of the GDC31 must be accomplished by an approved service facility using DAC International approved maintenance manual, P/N 1049-2500-01. On aircraft servicing is limited to removal and replacement of the GDC31 and repair of the interconnect wiring. Refer to the following tables and lists, and appendices A through G.

All wiring is 22 to 24AWG.

- Single Wire: MIL-W-22759/16 or equivalent
- Shielded Wire: MIL-C-27500 or equivalent
- Circuit Breaker: Klixon 7277-2-2 or equivalent

Mounting Hardware and Replacement Parts:

<u>Part Number</u>	<u>Description</u>
1049-4000-03*	GDC31, ROLL STEERING CONVERTER
MS35206-245	SCREW, PAN HD, CROSS POINT, 8/32 X .5
MS35338-42	WASHER, LOCK, #8, CAD PLTD
AN960-8L	WASHER, FLAT, STEEL, #8
MS35649-282	NUT, PLAIN HEX, STEEL, 8/32
M24308/2-3F	CONNECTOR, RECEPTACLE, 25 PIN D-SUB
M39029/63-368	SOCKET, CRIMP, FEMALE
P10219*	SLIDE LATCH KIT
P10220*	BACKSHELL, 25 PIN D-SUB, SIZE 3
P10280*	MODE ANNUNCIATOR/SWITCH WITH 28V LAMPS
P10301*	LAMP, 14V

*Available through DAC International

5. MAINTENANCE INSTRUCTIONS

Condition and airworthiness inspections of the GDC31 will coincide with each Annual and/or 100-hour inspection. Other than regular periodic inspections and functional checks outlined here, maintenance of the GDC31 is “on condition” with no specific overhaul period.

At each Annual and/or 100-hour inspection:

1. The GDC31 will be inspected for security and attachment.
2. The switch/annunciator will be inspected for legibility and attachment.
3. Wiring integrity will be inspected according to AC 43.13-1B, Paragraph 11-96. Refer to wiring diagrams in the appendices.
4. Perform a functional test in accordance with paragraph 3.2.

6. TROUBLESHOOTING INFORMATION

SYMPTOM	RESOLUTION
GPS annunciator fails to turn on.	<ol style="list-style-type: none">1. Check Avionics Master Switch in the ON position.2. Check RSC circuit breaker set.3. Verify Mode annunciator lamps are serviceable.4. Remove GDC31 and check wiring IAW wiring diagram.5. Remove and replace GDC31.
GPS annunciator blinks.	<ol style="list-style-type: none">1. Verify GPS receiver is on and operational.2. Remove GDC31 and check wiring IAW wiring diagram.3. Remove and replace GDC31.
Aircraft overshoots or undershoot when intercepting GPS course.	<ol style="list-style-type: none">1. Verify program pin wiring is according to wiring diagram.2. Verify Reference input voltage is present according to wiring.3. Check remaining wiring IAW wiring diagram.4. Remove and replace GDC31.

7. REMOVAL AND REPLACEMENT INFORMATION

7.1 Equipment Removal

7.1.1 GDC31 Removal

1. Open the circuit breaker powering the GDC31.
2. Disengage connector slide-latch, unplug connector.
3. Remove 4 retaining screws and related hardware (retain hardware for later installation).

7.1.2 Mode Annunciator Removal

1. Open the circuit breaker powering the GDC31.
2. Pull firmly on the edges of the lens to disengage the lamp assembly from the body. The lamp assembly will hinge out and away from the body.
3. Release the two (2) pawls by unscrewing the flat-head screws located inside the body.
4. Unplug the lamp module from the sleeve.

7.2 EQUIPMENT INSTALLATION

7.2.1 GDC31 Installation

1. Open the circuit breaker powering the GDC31.
2. Attach GDC31 using 4 retaining screws and other hardware from removal procedure.
3. Attach connector and secure using slide-latch.
4. Close the circuit breaker.
5. Perform Equipment Checkout per 3.2.

7.2.2 Mode Annunciator Installation

1. Open the circuit breaker powering the GDC31.
2. Plug the lamp module into the sleeve.
3. Secure by engaging the two (2) pawls to the sleeve.
4. Plug the lamp module into the body - it will snap into place.
5. Close the circuit breaker.
6. Perform Equipment Checkout per 3.2.

8. DIAGRAMS

See appendices for wiring and equipment location diagrams.

9. SPECIAL INSPECTION REQUIREMENTS

NONE

10. APPLICATION OF SPECIAL TREATMENTS

NONE

11. DATA

Refer to Master Drawing List 1049-0000-XX.

12. SPECIAL TOOLS

Use the following crimp tool to ensure reliable crimp contact connections to connector J1.

- Crimp tool M22520/2-01
- Positioner M22520/2-08

13. RECOMMENDED OVERHAUL PERIODS

NONE

14. AIRWORTHINESS LIMITATION SECTION

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

NONE

15. REVISIONS

The Design Change Notification Procedure outlined in the DAC International Quality Assurance Manual will be used to inform service centers, distributors and the FAA of significant changes to this ICA. For further information, contact DAC International at (512) 331-5323 or www.dacint.com. In addition, the latest approved revision of this ICA is available at <http://www.dacint.com/ecd/ecdtech.htm>

APPENDIX A – Follow-On Installation Data Instructions

For follow-on installations, complete the data sheet and wiring diagram found on the following pages.

On the data sheet, complete the aircraft make and model, registration number and serial number sections. Then describe the location of the GDC31 converter in sufficient detail, using station location numbers or other common reference points. For example, “GDC31 located under the instrument panel, right outboard side.” Use of sketches is recommended. Likewise describe the location of the annunciator/ switch. Describe or sketch the wire bundle routing.

Mark-up the Follow-on Installation Wiring Diagram to reflect the aircraft wiring. Use of wiring diagrams extracted from the installation manual, 1049-2510-01, or sketches are also acceptable.

Include a copy of this document along with the data sheet and wiring diagram with the aircraft records.

APPENDIX A – Follow-On Installation Data Sheet

AIRCRAFT MAKE AND MODEL: _____

AIRCRAFT TAIL NUMBER: _____

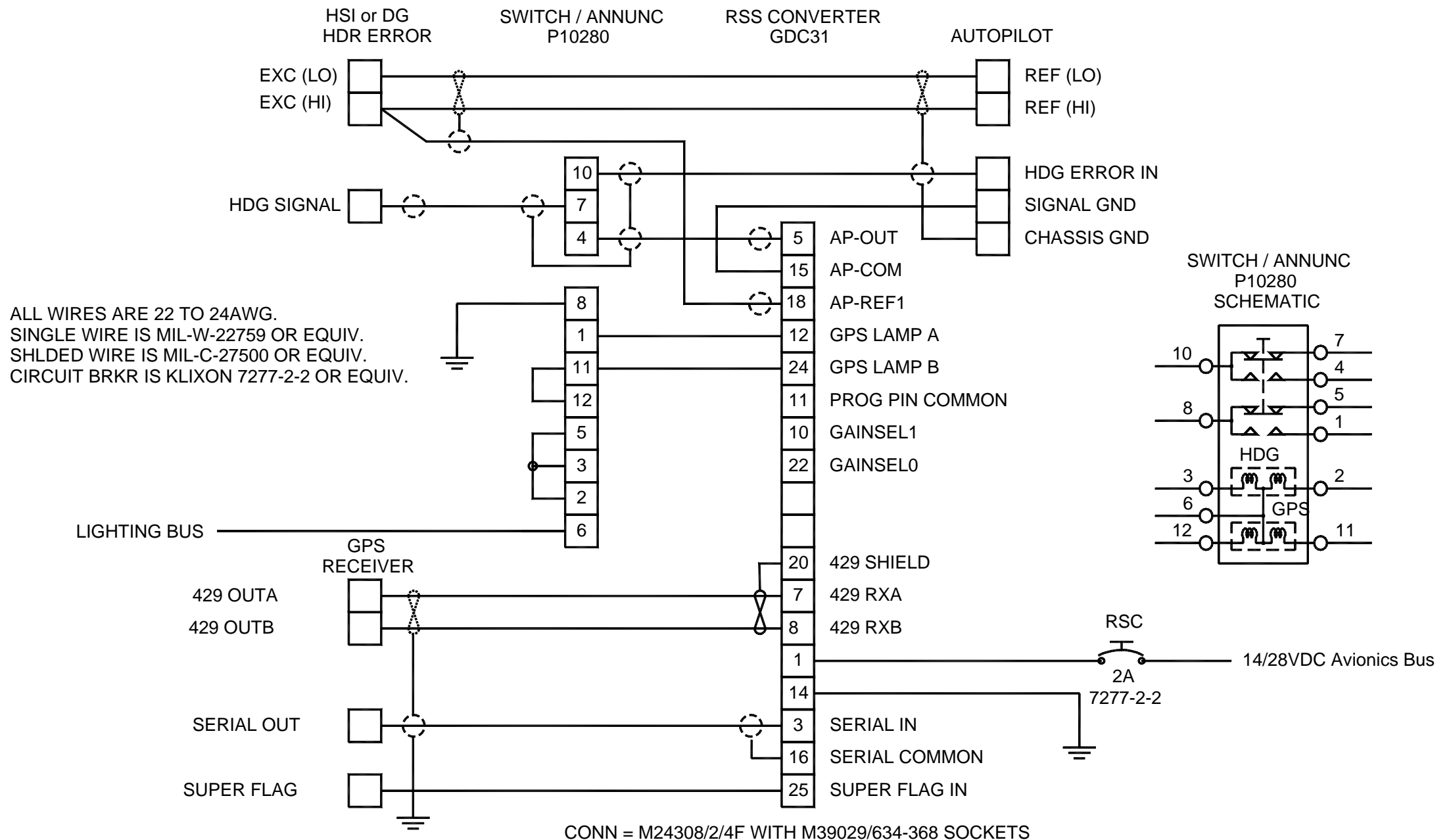
AIRCRAFT SERIAL NUMBER: _____

LOCATION DESCRIPTION of GDC31 ROLL STEERING CONVERTER:

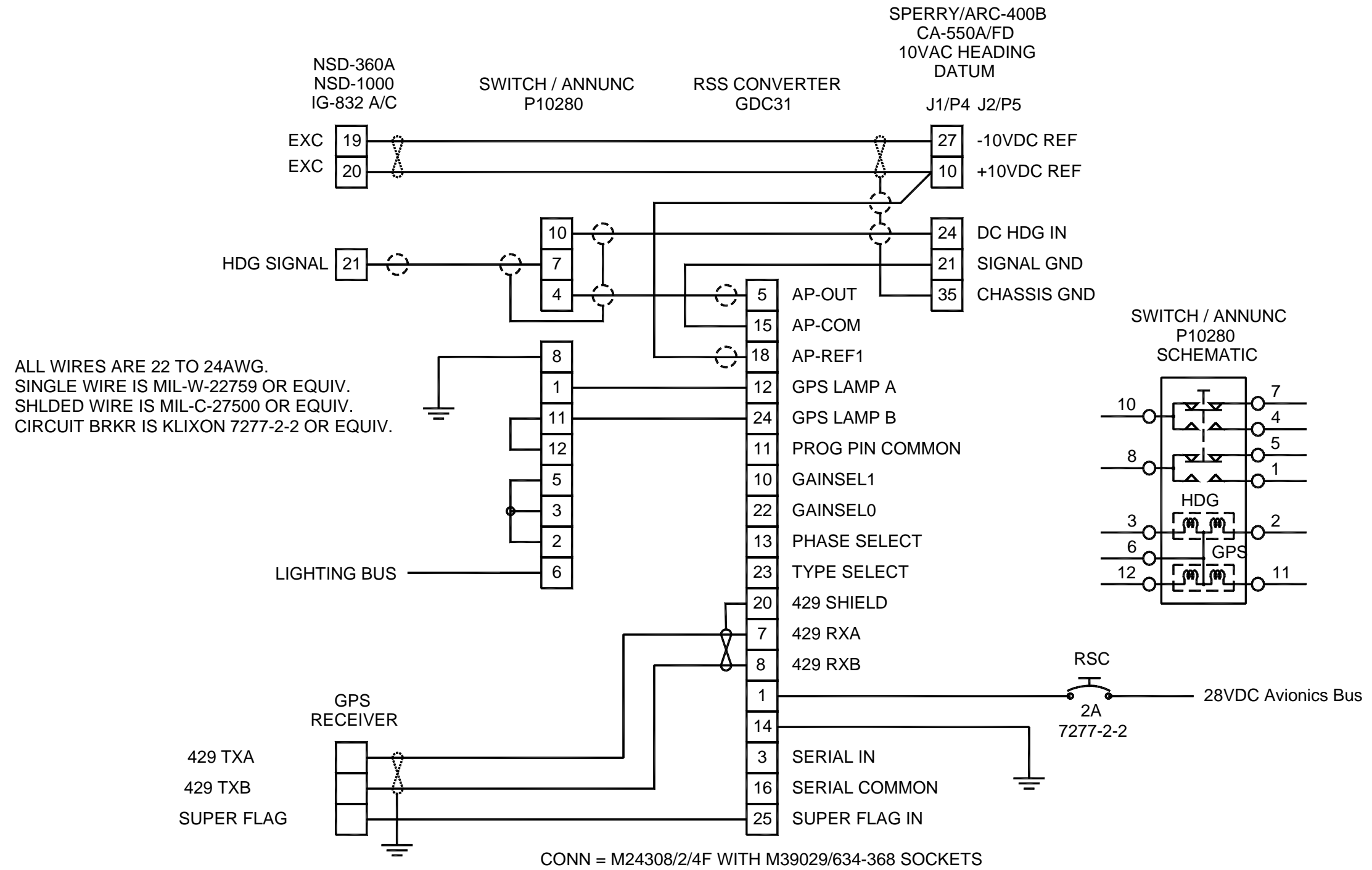
LOCATION DESCRIPTION of MODE/ANNUNCIATOR switch:

WIRE ROUTING:

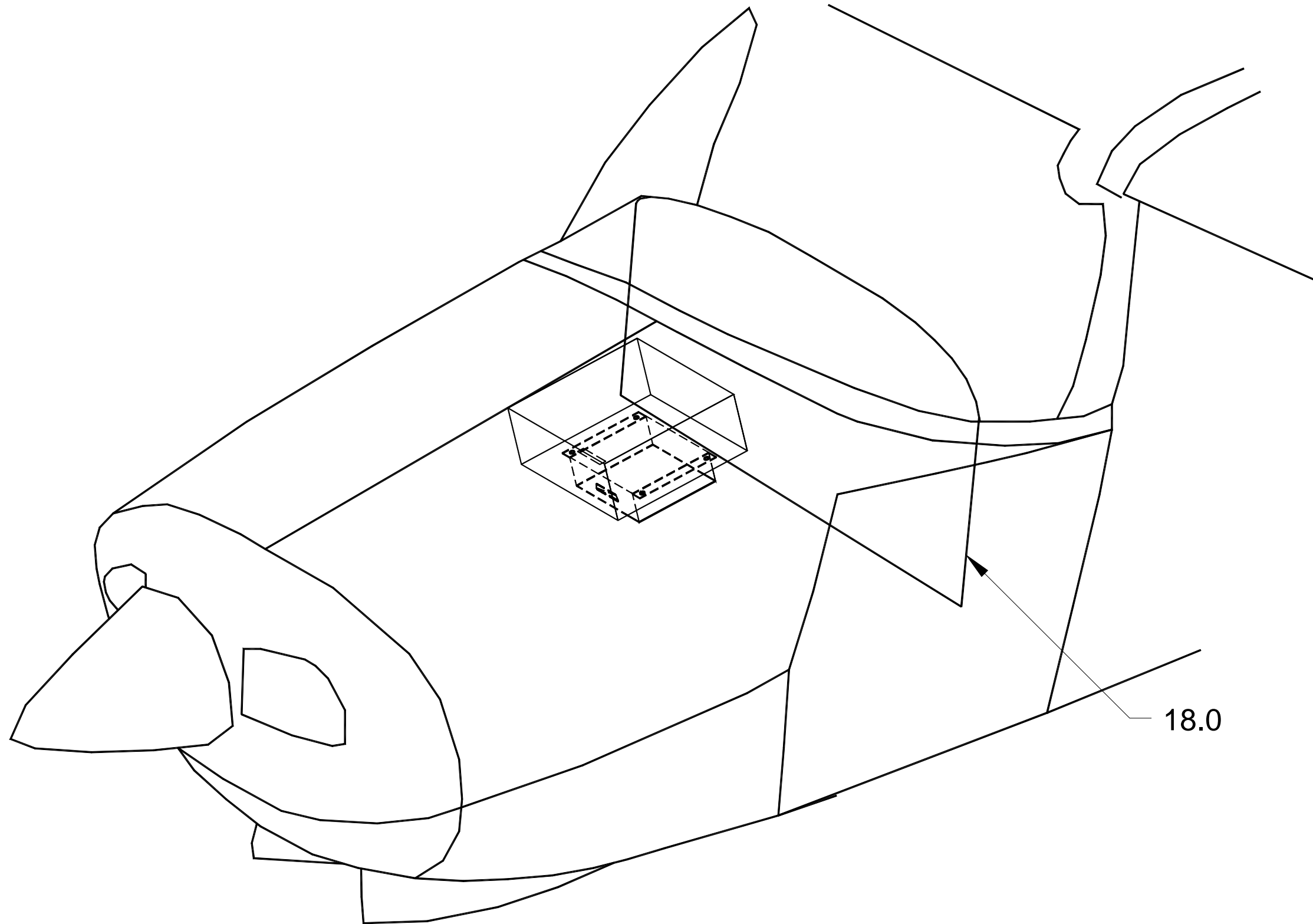
APPENDIX A – Follow-On Installation Wiring Diagram



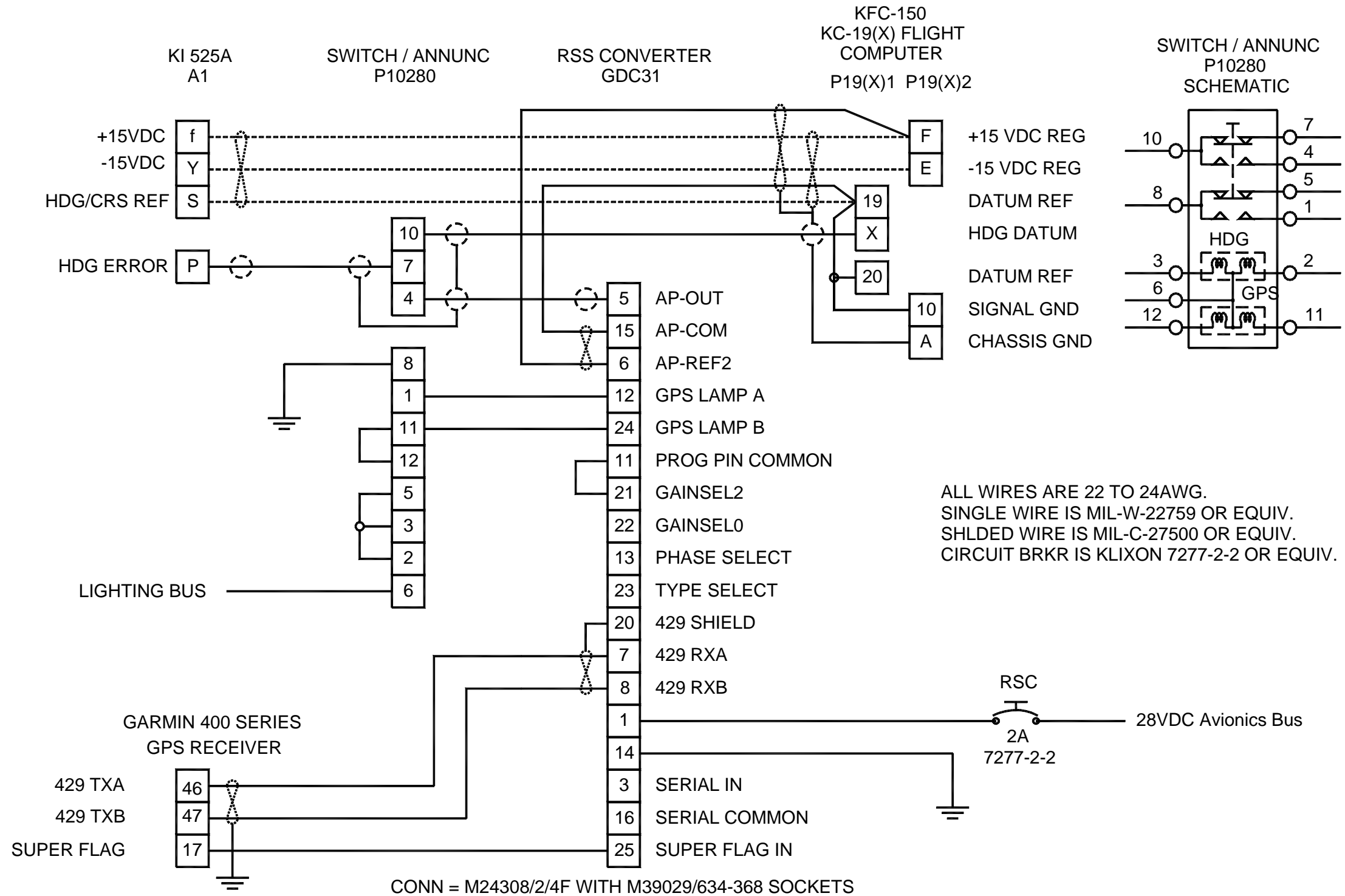
APPENDIX B – Wiring Diagram for the Cessna T210M Centurion



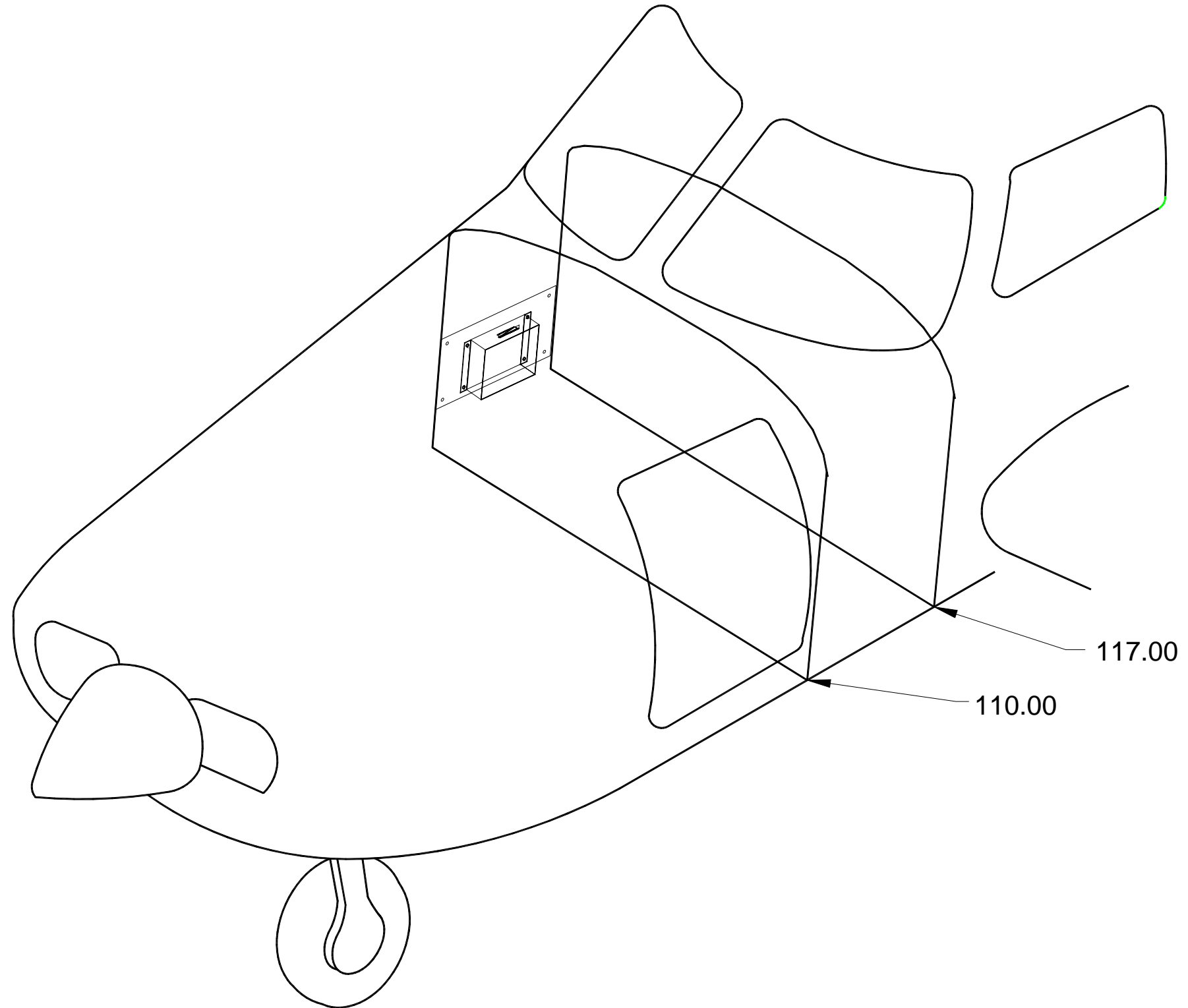
APPENDIX C – Equipment Locations for the Cessna T210M Centurion



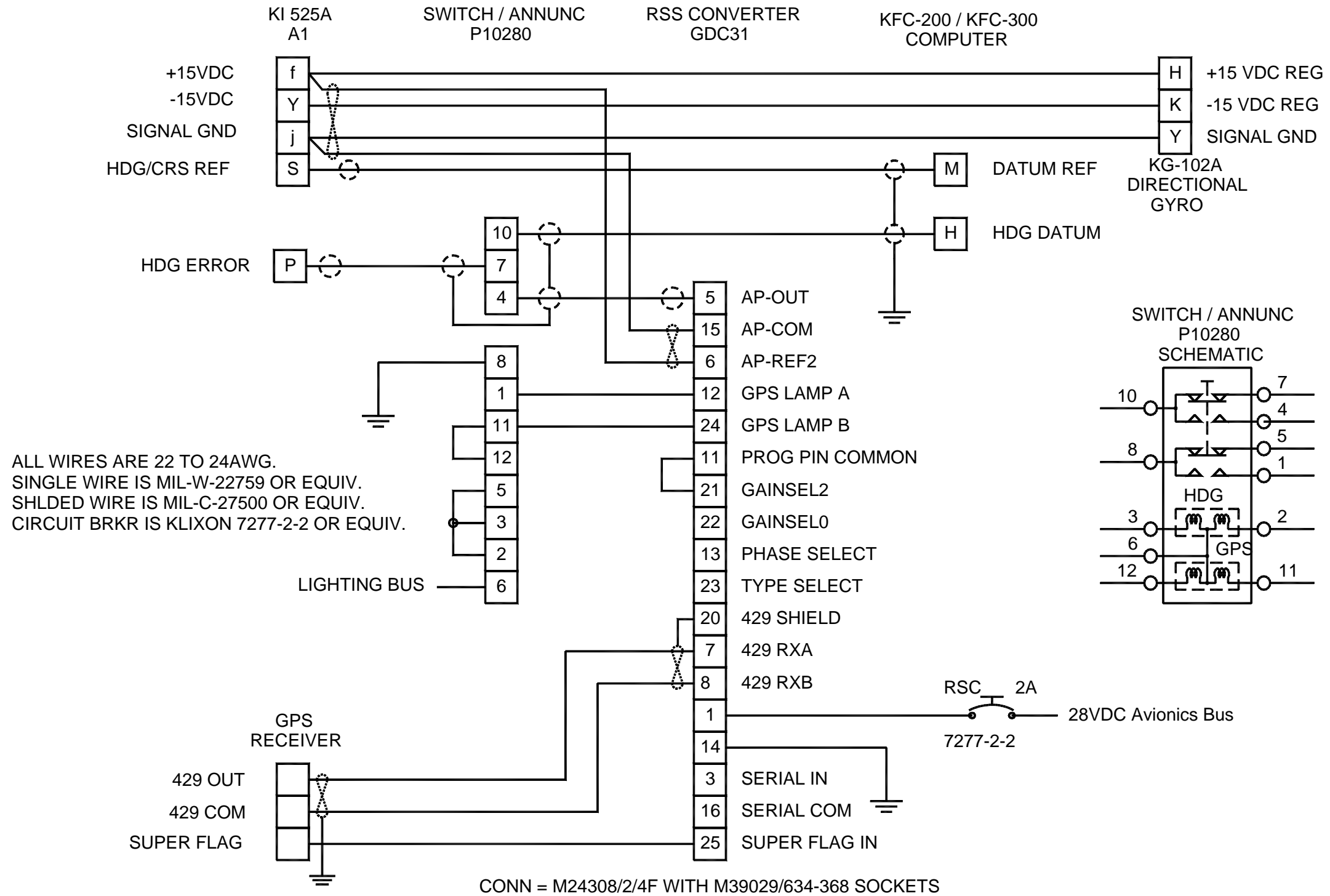
APPENDIX D – Wiring Diagram for the Piper PA46-310P Malibu



APPENDIX E – Equipment Locations for the Piper PA46-310P Mailbu



APPENDIX F – Wiring Diagram for the Beech 58P Baron



APPENDIX G – Equipment Locations for the Beech 58P Baron

