

GDL 90 UAT Data Link Sensor

Capstone Upgrade Instructions

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HISTORY OF REVISIONS

Revision	Date	Description
--	3/17/04	Initial release
A	4/30/04	Remove "STC Pending" watermark. List CD in ordering info. Add washer to install kit, update APM p/n (Table 1-2). Add tray side view (Figure 2-2). APM wiring 4 inches maximum (2.5.1.2). Add transmitter caution statement (2.5.1.3).

ORDERING INFORMATION

To receive additional copies of GDL 90 publications, order the following part numbers:

GDL 90 Installation Manual	560-1049-xx
GDL 90 Capstone Upgrade Instructions	560-1057-xx
GDL 90 Product CD	140-0063-xx

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1 GENERAL INFORMATION

1.1 SCOPE

This manual contains the instructions for upgrading existing Capstone UAT to the GDL 90 Data link Sensor. It is intended for use by persons certified by the Federal Aviation Administration (FAA) to install avionics devices.

This document is to be used as a supplement to the GDL 90 Installation Manual, Part No 560-1049-xx, which is included in the GDL 90 Product CD. The information in this manual is STC approved. Only the equipment interfaces covered in this manual are within the scope of this STC. Refer to the GDL 90 Installation Manual for more descriptions on interfaces.

NOTE

Since the upgrade installation is different from the standard installation in mounting tray and hardware, this manual should be used to install the GDL 90 in existing Capstone installations and the GDL 90 Installation Manual should be used for certification limitation, product specifications, system checkout, troubleshooting and maintenance procedures.

1.2 PACKAGE CONTENTS

The GDL 90 Capstone Upgrade Installation Kit includes most necessary items for installation other than supplies normally available at the installation shop, such as wire and cable ties, circuit breakers. The items included in the package are listed in Table 1-1 and Table 1-2.

Table 1-1 - Package Contents

Part #	Qty	Description
424-6081-150	1	GDL 90 Capstone Upgrade Installation Kit (see Table 1-2 for detail)
430-6081-1xx-xxx	1	GDL 90 UAT Data Link Sensor
140-0063-xx	1	GDL 90 Product CD
560-1057-xx	1	GDL 90 Capstone Upgrade Instructions

Table 1-2 - Installation Kit Contents (PN 424-6081-150)

Part #	Qty	Description
162-0043	3	Connector, coax, RA, PNL MNT
265-0007	3	Retainer Ring, ext, 7/16 shaft
240-0008	3	Washer, 0.446 ID 0.56 OD
162-1574	1	Receptacle DSUB 9-pin
310-0467-00	1	Capstone Phase 1 Adapter Plate
500-0290-00	1	Capstone Phase 1 Adapter Cable
202-0002	8	Cable tie
245-0027	7	Crimp contact, DSUB, 20 to 24 AWG wire
224-0404	4	Screw, 4-40 x 1/4 SS flat head Phillips 82 deg.
310-0461-00	1	Cover Mounting Tray GDL 90
310-0462-00	1	Mounting Tray GDL 90
430-6200-000	1	Aircraft Personality Module (APM), GDL 90

2 INSTALLATION

This section describes the installation of the GDL 90 including mounting, wiring, and connections. Refer to the GDL 90 Installation Manual for limitations and post-installation configuration and checkout procedures.

2.1 PRE-INSTALLATION INFORMATION

Always follow acceptable avionics installation practices per FAA Advisory Circulars (AC) 43.13-1B, 43.13-2A, or later FAA approved revisions of these documents.

Follow the installation procedure in this section as it is presented for a successful installation. Read the entire section before beginning the procedure. Prior to installation, consider the structural integrity of the GDL 90 installation as defined in AC 43.13-2A, Chapter 1. Perform the post installation checkout before closing the work area in case problems occur.

Complete an electrical load analysis in accordance with AC 43.13-1B, Chapter 11, on the aircraft prior to starting modification to ensure aircraft has the ability to carry the GDL 90 load. Document the results of the electrical load analysis on FAA Form 337.

2.2 MATERIALS NOT SUPPLIED

2.2.1 MATERIALS REQUIRED BUT NOT SUPPLIED

The GDL 90 is intended for use with standard aviation accessories. The following items are required for the installation, but not supplied:

- Wire (MIL-W-22759/16 or equivalent)
- Shielded wire (MIL-C-27500 or equivalent)
- Circuit breakers
- Ring terminals (for grounding)

2.3 SPECIAL TOOLS REQUIRED

Some of the connectors use crimp contacts. The tables below identify crimp tools required to ensure consistent, reliable crimp contact connections for the rear D-SUB connectors. The tables define one source for the crimp tool. Alternate equivalent tools may be used.

Table 2-1 - Crimp Tool for P/N 245-0027

Description	ITT/Cannon P/N	Military number
Insertion/Extraction tool CIET-20HD	980-200-426	M81969/39-01
Crimp tool	995-0001-584	M22520/2-01
Positioner	995-0001-604	M22520/2-08

Below is the contact for ITT/Cannon crimp tools:
 ITT Cannon Phone (714) 261-5300
 1851 E. Deere Ave FAX (714) 575-8324
 Santa Ana, CA 92705-6500

2.4 EQUIPMENT MOUNTING

The Capstone Upgrade Installation Kit is intended for the replacement of the old UAT radio and tray with the GDL 90 and tray in the same mounting holes.

2.4.1 ADAPTER PLATE & MOUNTING TRAY INSTALLATION

Remove the old UAT radio and tray. Install the adapter plate using four 8-32 pan-head screws (MS35206, AN526 or equivalent) in the same mounting holes used for the old tray. Install the GDL 90 mounting tray on top of the adapter tray using four 8-32 pan-head screws. Refer to Figure 2-1 and Figure 2-2 for the GDL 90 adapter plate and mounting tray dimensions.

After the adapter cable is installed to the mounting tray back plate, route wiring bundle as appropriate. Use cable ties to secure the cable assemblies and coax to the holes provided in the side of the connector plate to provide strain relief for the cable assemblies. The cable shields should be grounded directly to a lug mounted to one of the holes on the side of the connector plate, keeping the ground leads to a maximum of 3 inches long.

Optional cover is provided for installations that need extra moisture protection. Install cover to aft side of tray using 4 provided screws.

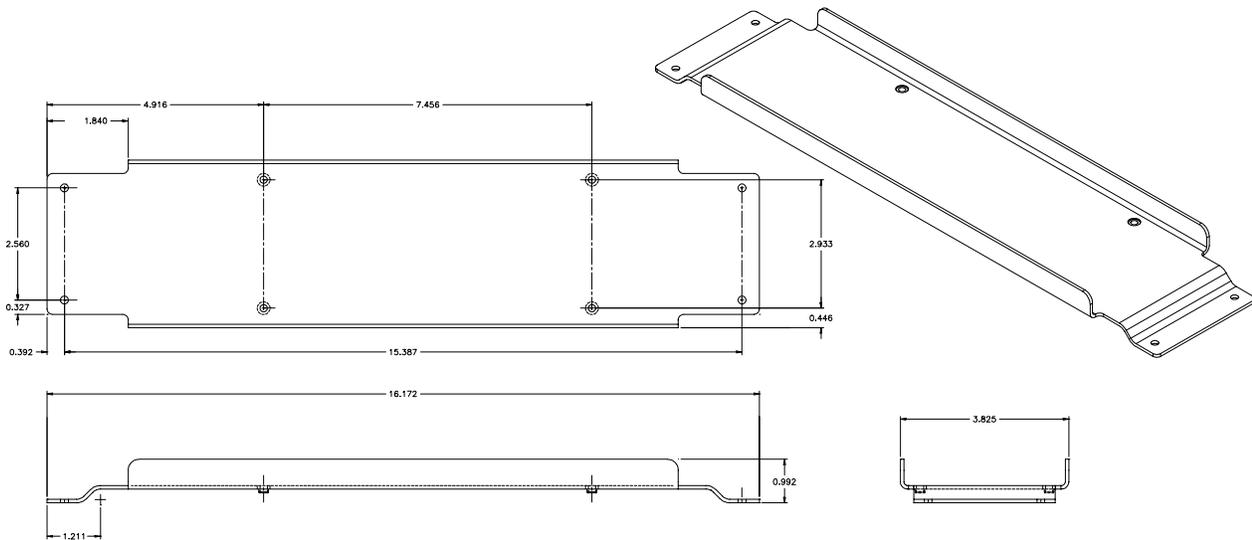
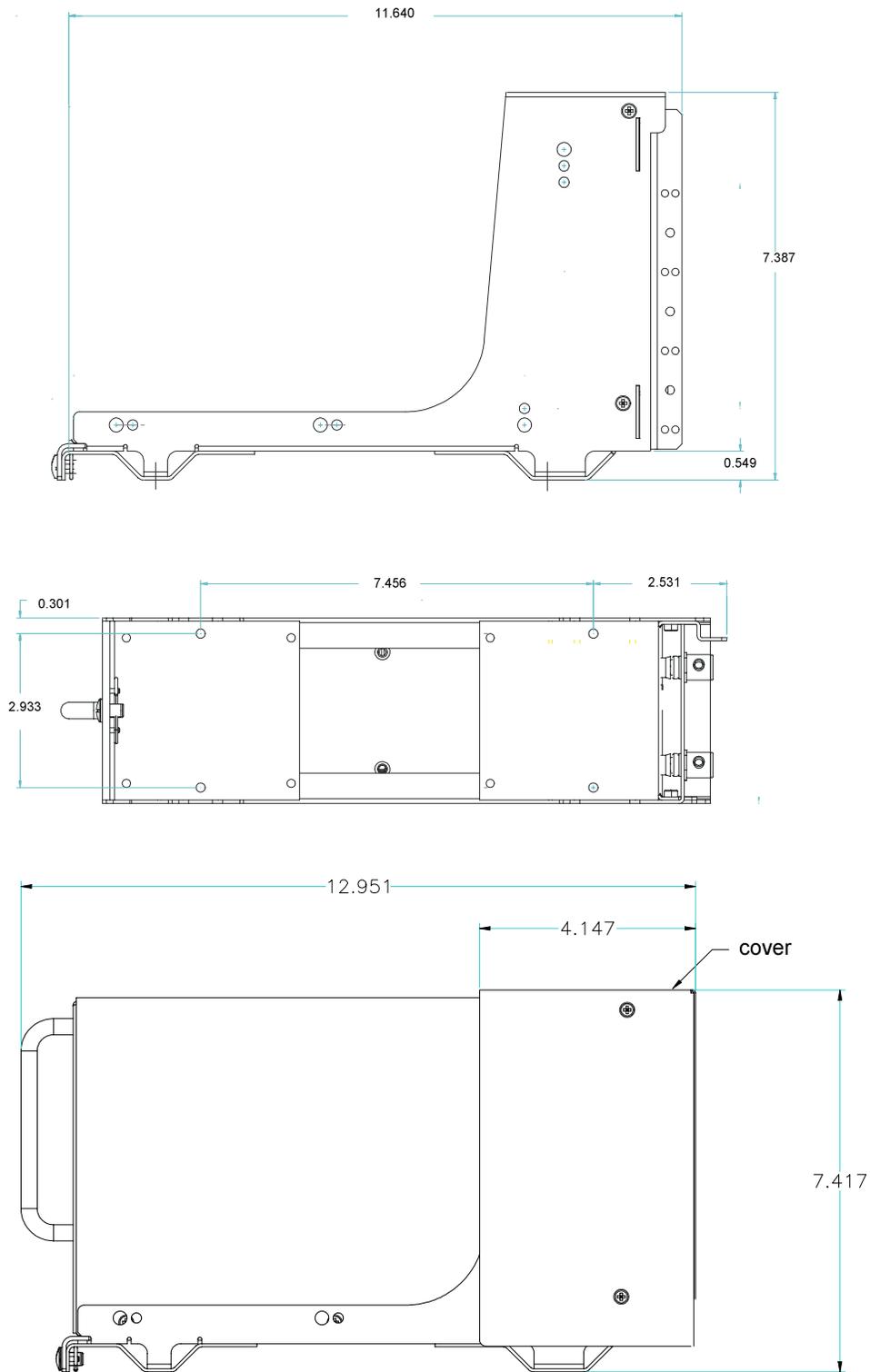


Figure 2-1: GDL 90 Adapter Plate



GDL 90 in tray with optional cover

Figure 2-2: GDL 90 Mounting Tray

2.5 ELECTRICAL CONNECTIONS

The GDL 90 Capstone Upgrade Installation Kit includes the adapter cable and three coax connectors. The connector layouts are shown in Figure 2-6. The D-sub connectors use the supplied crimp contacts as specified in Table 2-2. Make the crimp connections with the crimp tool specified.

Table 2-2 - Interface Connectors

Figure 2-6		Connector		Crimp Contact	
Ref.	Description	P/N	Description	P/N	Description
P1	Main System	162-1575	15 Pin D-Sub Receptacle	245-0027	20-24 AWG socket contact
P2	I/O	162-1577	37 Pin D-Sub Receptacle	245-0027	20-24 AWG socket contact
n/a	Maint. Port	162-1574	9 Pin D-Sub Receptacle	245-0027	20-24 AWG socket contact
P3	GPS antenna	162-0043	Coax connector, right angle	N/A	N/A
P4	UAT ant (top)	162-0043	Coax connector, right angle	N/A	N/A
P5	UAT ant (bot)	162-0043	Coax connector, right angle	N/A	N/A

The following table shows the specifications for the crimp contacts. Alternate crimp contact part numbers may be used that are equivalent to those specified in the table below.

Table 2-3 - Crimp Contact Specifications

Garmin AT Part Number	245-0027
Description	20-24 AWG crimp socket contact
Color bands	Orange/Blue/Gray
ITT/Cannon P/N	031-1007-042
Military number	M39029/63-368

2.5.1 CABLING AND WIRING

2.5.1.1 Adapter Cable

An adapter cable is provided with the GDL 90 Upgrade Installation Kit. Install the adapter cable as follows:

- Mount the DB15 and DB37 connectors of the cable to the mounting tray backplate
- Connect the DB37 connector of the adapter cable to the DB37 connector of the existing wiring. Fasten with 2 screws (provided.)
- Attach cable ground lug to one of the holes on the side rail of backplate with a #4 screw

2.5.1.2 APM and Maintenance Connector

Connect the micro APM to the DB15 connector of the adapter cable using crimp socket contacts (provided). The APM may be fastened to the backplate of the tray close to the 37-pin connector using cable ties through holes on the backplate. Refer to Figure 2-3 for more details. APM wiring must be 4 inches maximum length.

Connect the DB9 Maintenance PC connector to the DB15 connector of the adapter cable using crimp socket contacts (provided) and 3-conductor wire. The Maintenance DB9 connector should be secured

from vibration and located in a convenient location for easy connection to a computer as the computer will be used to configure and troubleshoot the GDL 90. The length for this cable should not exceed 20 feet.

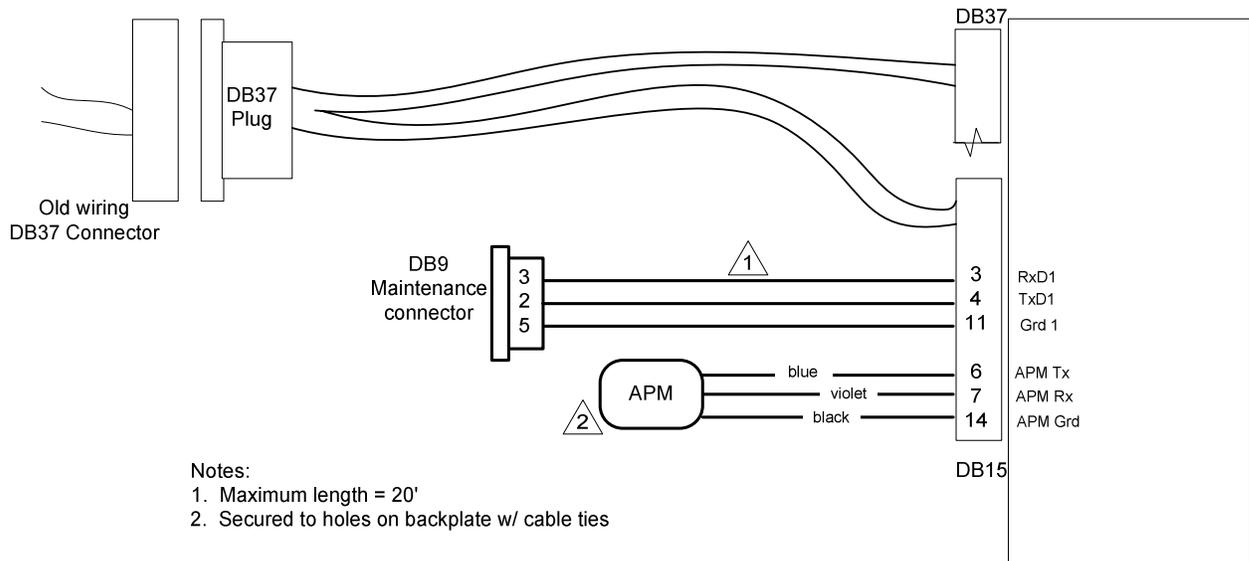


Figure 2-3: APM and Maintenance Connector Installation

2.5.1.3 Antenna Connectors

UAT antenna cables from the previous UAT system need to be modified (or extended if not of sufficient reach) to right-angle coax connectors (Part No. 162-0043). Refer to Figure 2-5 for assembly instructions.

CAUTION

Operating the GDL 90 with no RF terminations on the Top or Bottom UAT Antenna ports can result in equipment damage. Always operate the GDL 90 with the Top and Bottom UAT Antenna ports terminated with a VSWR ratio of 3.0:1 or less.

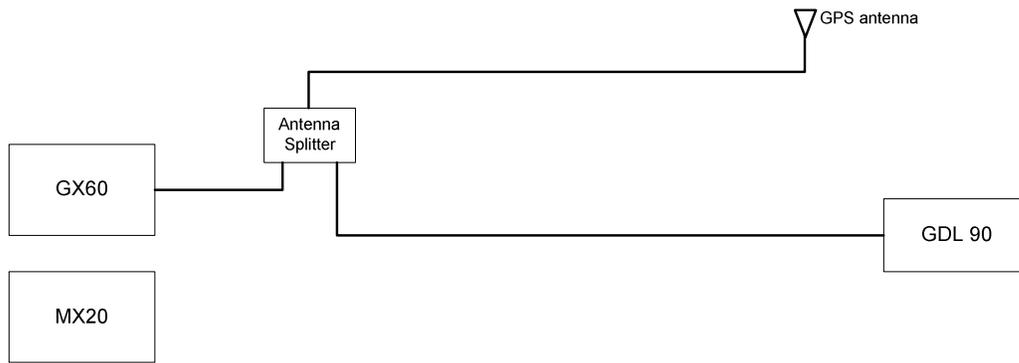
For the GPS connection, there are 3 wiring options as depicted in Figure 2-4. GPS signal connection to the MX20 shall be disconnected and rerouted to the GDL 90. If only one GPS antenna is installed, a signal splitter may be used to provide GPS signal to the GX60 and the GDL 90 as long as the primary navigator, the GX60, provides power to the splitter and the total cable loss from the antenna to the GDL 90 is from 3 to 7 db. If SatCom is installed on the aircraft, the cable loss shall be 3 dB minimum to ensure proper interference rejection from SatCom. The coaxial connectors and adapters, such as TNC to BNC and signal splitter, add additional loss to the cable and should be considered when computing the cable loss. A typical loss of 0.2 dB can be used for each connection. The typical cable loss for 20 feet of RG-400 coax with a connector one each end is 4 dB.

During the post-installation checkout, susceptibility to harmonics of VHF comm. transmitters will be evaluated. If problems arise, then better isolation, or distance, may be required between the GPS and

comm antennas, or a 1575.42 MHz notch filter may be installed in series with the antenna coax of the VHF comm transceiver to reduce or eliminate the harmonic interference. A notch filter (part #162-1059) is available from Garmin AT.

If a VHF comm transmitter causes problems with the GPS on the selected frequencies as listed in the post-installation checkout, the problem may be due to the ELT. This can be verified by disconnecting the ELT antenna coax at the ELT unit. If the ELT is found to cause the problem, then contact the ELT manufacturer or replace the ELT.

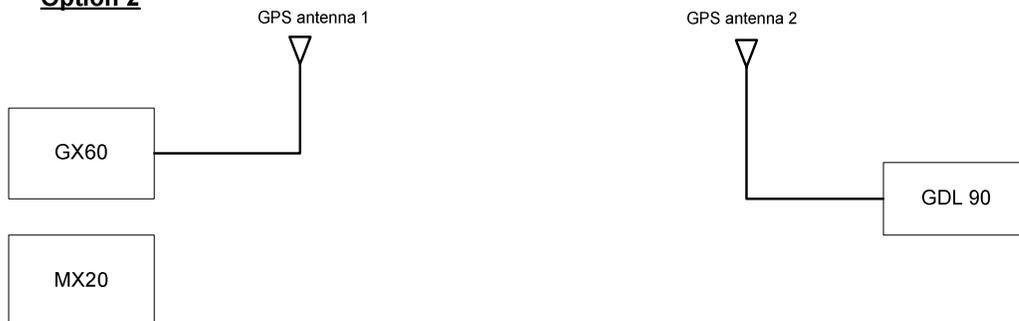
NOTE
To preserve certification integrity, it is important that the GX60 continues providing power to the GPS antenna splitter, if one is used.



Option 1



Option 2



Option 3

Figure 2-4: GPS Antenna Connections

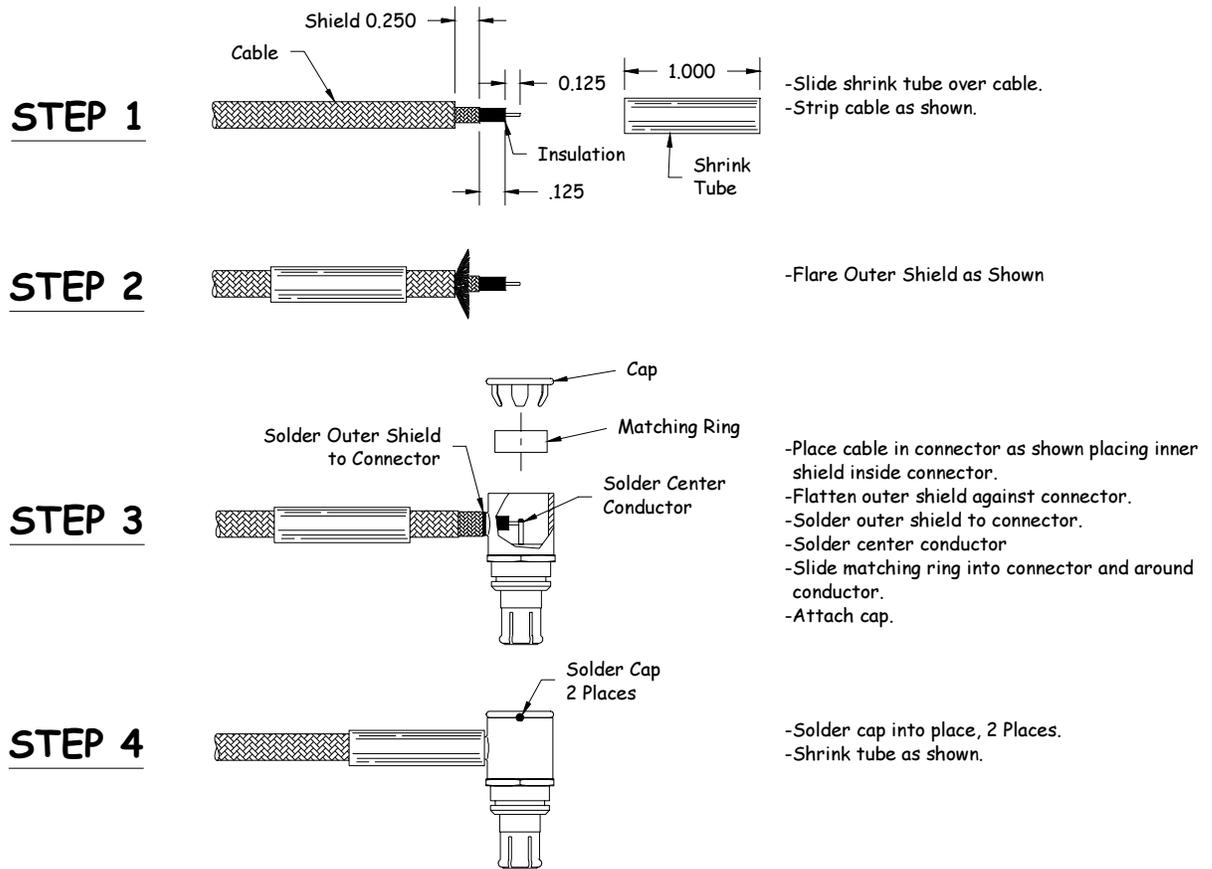


Figure 2-5: Right-Angle Coax Connector Assembly

2.5.2 INTERFACE CONNECTOR DEFINITION

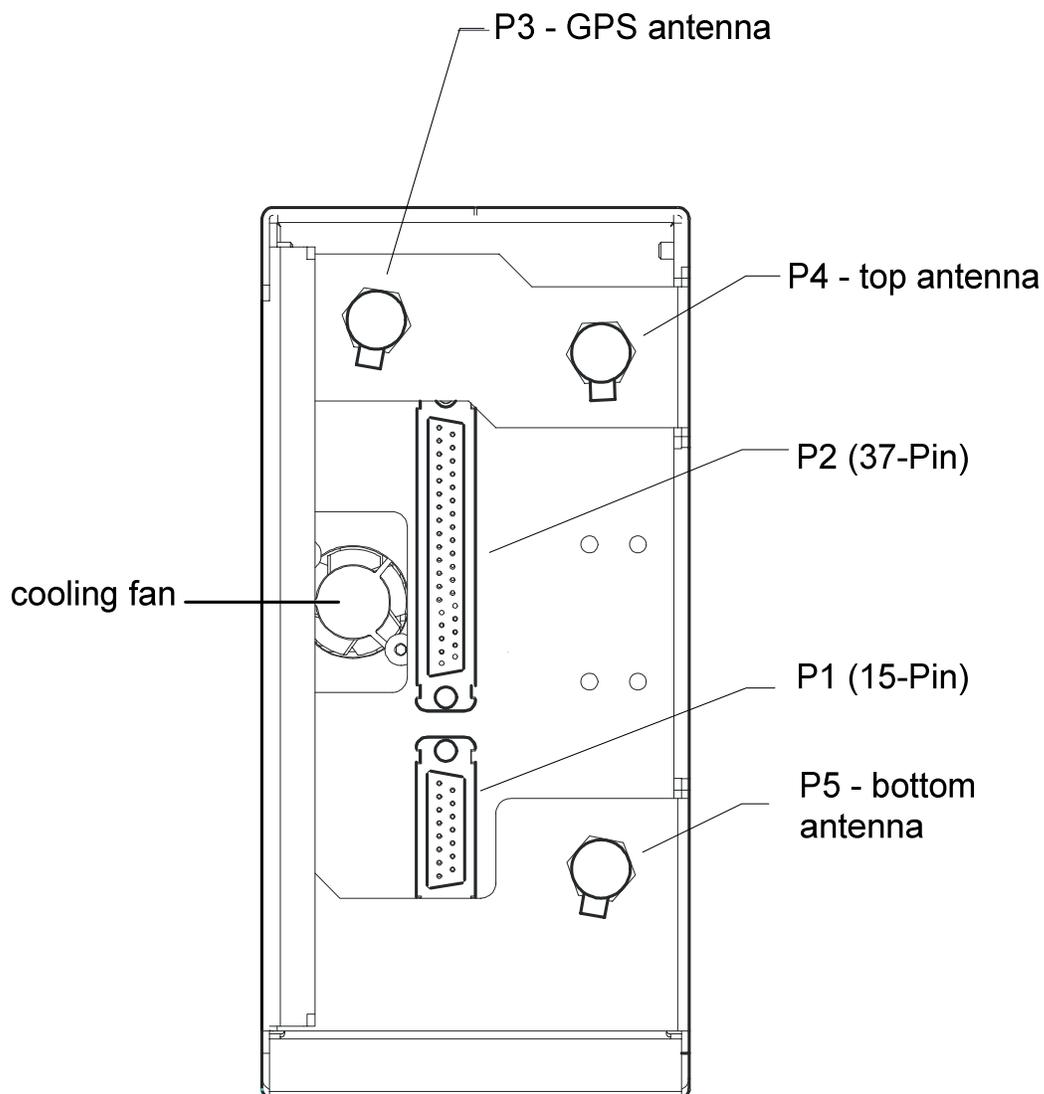


Figure 2-6: Rear Connector Layout

