

GARMIN GTX SERIES TRANSPONDER SYSTEM - DESCRIPTION AND OPERATION

1. General

- A. The Model 208/208B can have the Garmin GTX transponder system installed in the airplane. If the transponder system has one or two transponders installed, it will have one or two antennas installed (respectively). The transponder(s) are installed on the forward avionics shelf, forward of the multifunction display (MFD), the GTX-327 and GTX-330 transponders are installed in the center radio console. The antennas are installed on the bottom of the airplane, on the airplane skin, on the optional cargo pod or optional TKS system fairing. The antennas are connected through coaxial cable to the transponder units.
- (1) The GTX-327 or the GTX-330, these transponders are not used with Garmin G1000 Integrated Avionics System and are installed as optional equipment.
 - (2) The GTX-33, these transponder(s) are compatible with G1000 Integrated Avionics Software v.767.XX Family.
 - (3) The GTX-33ES, these transponder(s) are compatible with G1000 Integrated Avionics Software v.767.23 Only and are installed as optional equipment.
 - (4) The GTX-335R and the GTX-345R, are compatible with G1000 Integrated Avionics NXi System Software versions (v.2499.XX). The GTX-345R is installed as optional equipment in the number one position.
- B. The G1000 Integrated Avionics System has five principle software configurations, depending on your Aircraft Serial Number and/or Service Bulletins installed on your Aircraft. Become familiar with the installed software configuration. Each software configuration uses variants of Garmin LRU's which are NOT interchangeable between software configurations. Refer to Chapter 34, Garmin G1000 Integrated Avionics System - Description and Operation, and Figure 1 Sheet 1 and Figure 1 Sheet 2.

Table 1. Garmin GTX Series Transponder Configuration Options

GTX TRANSPONDER SERIES	POSITION NUMBER	ADS-B OUT COMPATIBLE	ADS-B IN COMPATIBLE
GTX-33	1 (Standard) and 2 (Optional), SEE NOTE 1, 2	NO	NO
GTX-33ES	1 (Optional) and 2 (Optional), SEE NOTE 2	YES, SEE NOTE 9	NO
GTX-335R	1(Standard) and 2(Optional), SEE NOTE 3	YES, SEE NOTE 4	NO
GTX-345R	1 (Optional), SEE NOTE 5	YES, SEE NOTE 4	YES, SEE NOTE 6
GTX-327	1 (Standard) and 2 (Optional), SEE NOTE 7, 8	NO	NO
GTX-330	1 (Standard) and 2 (Optional), SEE NOTE 7, 8	NO	NO

NOTE 1:

This transponder is only compatible with G1000 Software Version v.767.XX configuration.

NOTE 2:

If dual transponders are installed, can only use the GTX-33 in position one and two, or the GTX-33ES in position one and two.

NOTE 3:

This transponder can be installed in the number one position and number two position.

NOTE 4:

This transponder is only compatible with G1000 NXi System Software versions (v.2499.XX).

NOTE 5:

This transponder can ONLY be installed in the number one position.

NOTE 6:

For ADS-B IN functionality, the additional 15 pin high speed data bus connector must be installed/connected.

NOTE 7:

These transponders are NOT compatible with Garmin G1000 Integrated Avionics.

NOTE 8:

If installing dual transponders, can only use the GTX-327 in position one and two, or the GTX-330 in position one and two.

NOTE 9:

This transponder is only compatible with G1000 Software Version v.767.23 configuration.

- C. For an overall view of the GTX Series transponder system (Refer to Figure 1) For more detail on transponder/antenna location, refer to Chapter 34, Garmin GTX Series Transponder System - Removal/Installation.

NOTE: Not all transponders are shown, for more detail refer to Chapter 34, Garmin GTX Series Transponder System - Removal/Installation.

2. Description

- A. The Garmin GTX-327 and GTX-330 transponder system is a Mode A/Mode C radio transceiver that operates on microwave frequencies in communication with ground stations or other aircraft. Information transmitted and received includes aircraft-specific data and traffic information and displayed through the Garmin Dependent Position Determining System. The GTX-327 and GTX-330 transponders are located in the center radio panel.

NOTE: The GTX-327 and GTX-330 are not a part of the G1000 Avionics System.

- (1) The Garmin GTX-327 is installed on (as optional equipment) Airplanes 208 -00350 thru -00356, and Airplanes 208B -00900 thru -00974.
- (2) The Garmin GTX-330 is installed on (as optional equipment) Airplanes 208 -00365 thru -00499 and Airplanes 208B -01010 thru -01999.

- B. The Garmin G1000 GTX transponder system

- (1) The standard Model 208 Garmin G1000 Integrated Avionics System includes one GTX unit, but a second GTX transponder can be added to the baseline aircraft. In this case, each of the two transponders can be selected with the softkeys on PFD 1 or PFD 2.
- (2) The GTX transponder communicates with the GIA 63W/64W No. 1 and No. 2 through RS-232. Data is shown on each of the two Primary Flight Displays (PFD 1) and (PFD 2).
- (3) The operating mode is controlled with softkeys on the PFD.
- (4) Transponder 1 receives 28 Vdc electrical power through the XPDR 1 circuit breaker, found on the Avionics circuit breaker panel.
- (5) Transponder 2 receives 28 Vdc electrical power through the XPDR 2 circuit breaker, found on the Avionics circuit breaker panel.

- C. The Garmin G1000 NXi System Software versions (v.2499.XX) Transponder System

- (1) The Garmin G1000 NXi will only work with the GTX-335R and the GTX-345R
- (2) Both Transponders can be used for ADS-B OUT but only the GTX-345R can be used for ADS-B IN.
- (3) The GTX-345R works with the GTS 825 TAS that uses active interrogations of Mode S and Mode C to provide Traffic Advisories (TA) to the pilot.
 - (a) This system is passively able to alert the pilot of nearby traffic similar to ATC as well as display the information on the MFDs.

3. Operation

- A. Garmin GTX Series Transponder.

NOTE: Mode S operation is not compatible with GTX-335 series transponders.

- (1) The GTX series transponder is a radio transmitter and receiver that operates on microwave frequencies. The unit receives ground radar or TCAS interrogations at 1030 MHz and transmits a coded response of pulses to ground-based radar on a frequency of 1090 MHz. The transponder has an IDENT operation that activates the special position identification (SPI) pulse for 18 seconds.
- (2) The GTX series transponder communicates with Mode A, Mode C, and Mode S interrogation. Mode A responses have framing pulses and one of 4096 codes, which are different in position and number of pulses transmitted. Mode C responses have framing pulses and encoded altitude.
- (3) Ground stations can interrogate the Mode S transponders individually with the use of a 24-bit International Civil Aviation Organization (ICAO) Mode S address, which is specific to that particular airplane. Also, ground stations can

interrogate a GTX Series transponder for its Flight ID, which is the registration number or other call sign. The GTX series transponders make the maximum airspeed (set during configuration) available to Traffic Collision Avoidance Systems (TCAS) on other airplanes near the unit. This operation helps make TCAS advisories.

- (4) The GTX series transponder is capable of providing 1090 ES ADS-B Out Mode S extended squitter transmissions. The extended squitter output is transmitted periodically and contains such data as Altitude (barometric and GPS), GPS position, heading, and aircraft identification. The purpose of extended squitter transmission is to provide aircraft position and identification to ADS-B Ground Based Transceivers (GTR's) and other airplanes.
 - (a) The GTX-345R transponder is capable of providing ADS-B In functionality when the extra 15 pin high speed data bus connector is installed/connected. This requires Garmin G1000 NXi System Software versions (v.2499.XX) or greater.
- (5) Other equipment on board the aircraft may transmit in the same frequency band as the transponder, such as DME or another transponder. Mutual suppression is a synchronous pulse that is sent to the other equipment to suppress transmission of a competing transmitter for the duration of the pulse train transmission. The transponder transmission is suppressed by an external source and other equipment on board is suppressed by the GTX series transponder. This feature is designed to limit mutual interference.

Figure 1 : Sheet 1 : Garmin GTX Series Transponder System

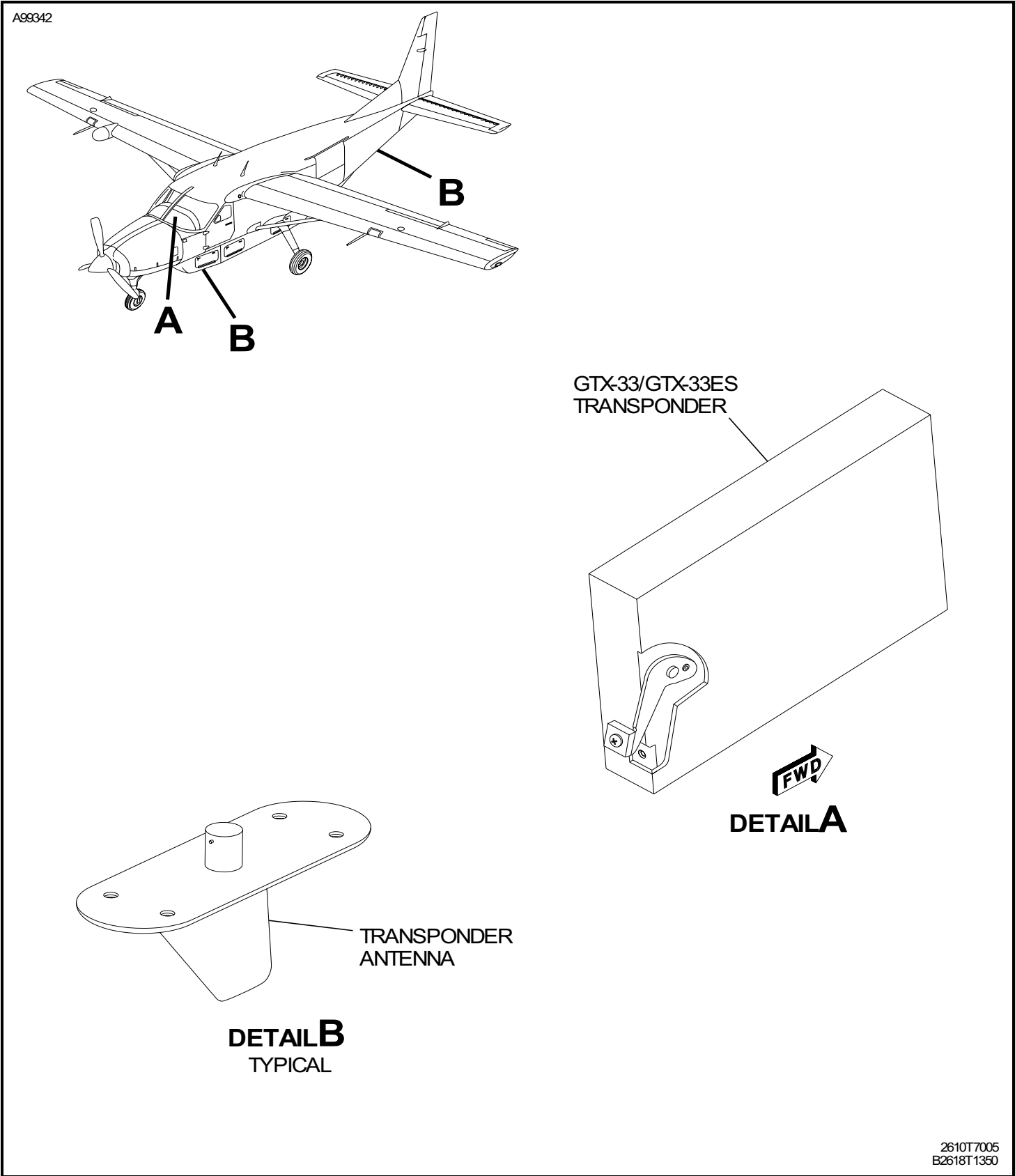


Figure 1 : Sheet 1 : Garmin G1000 Software Interface

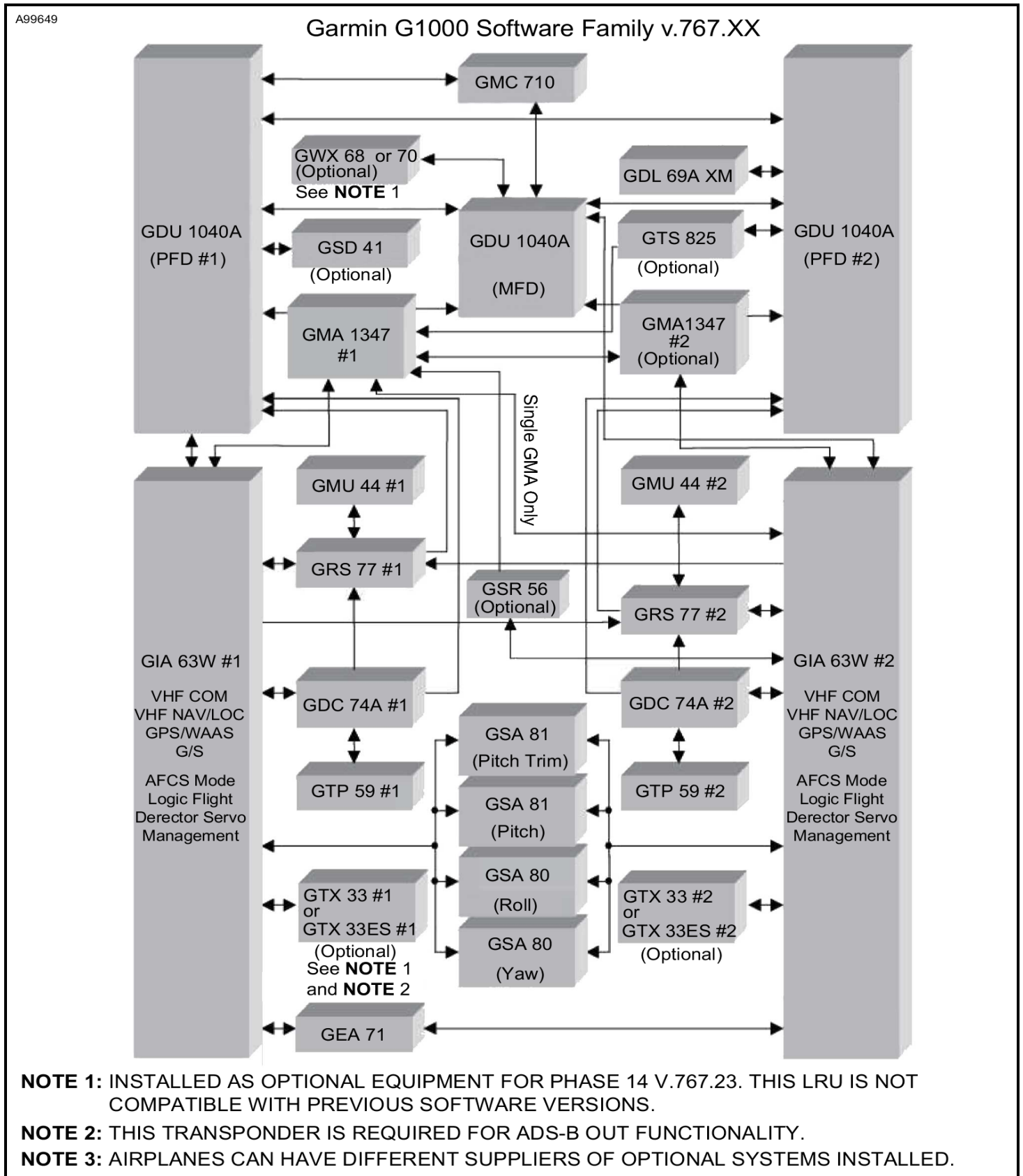


Figure 1 : Sheet 2 : Garmin G1000 Software Interface

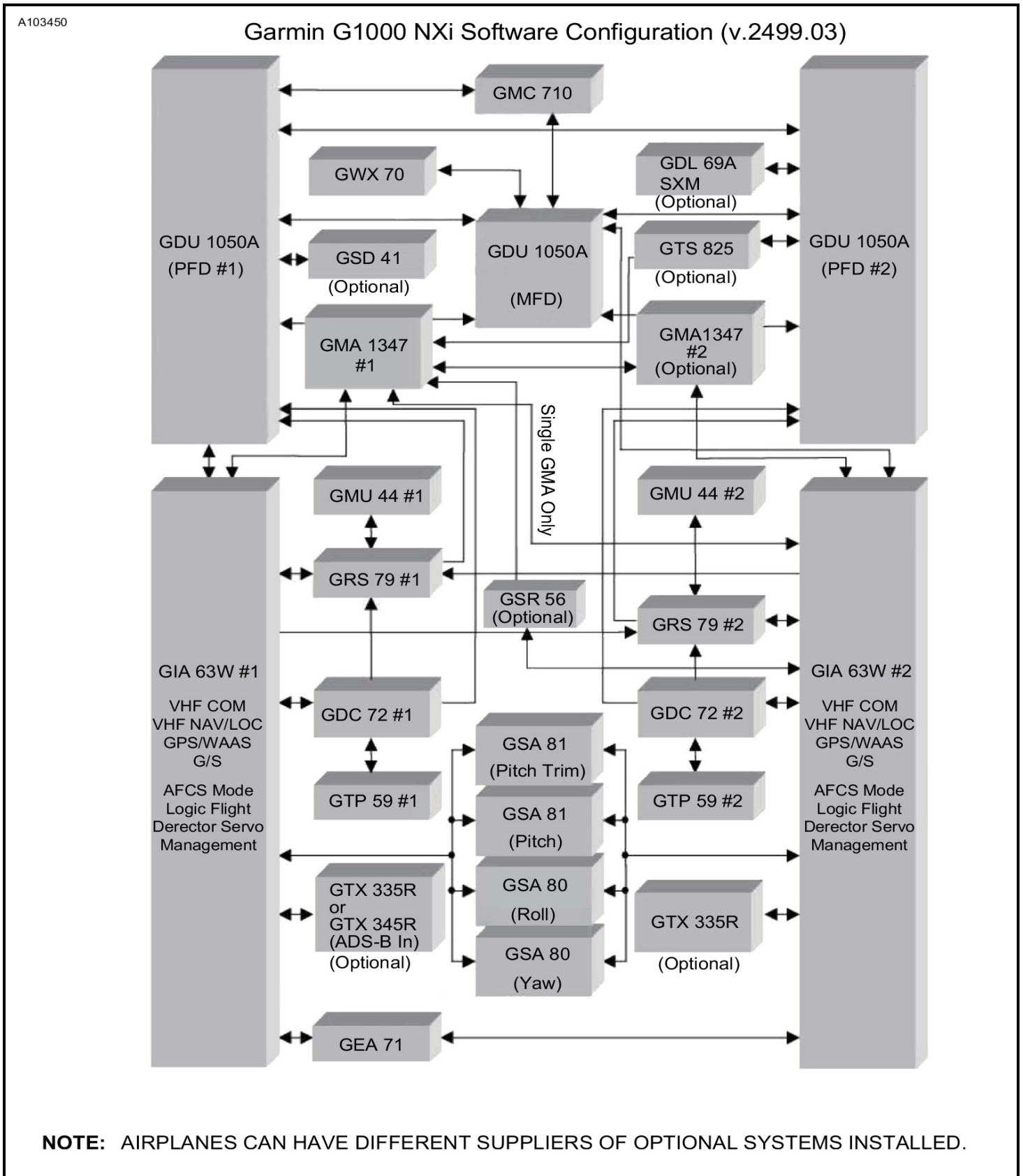
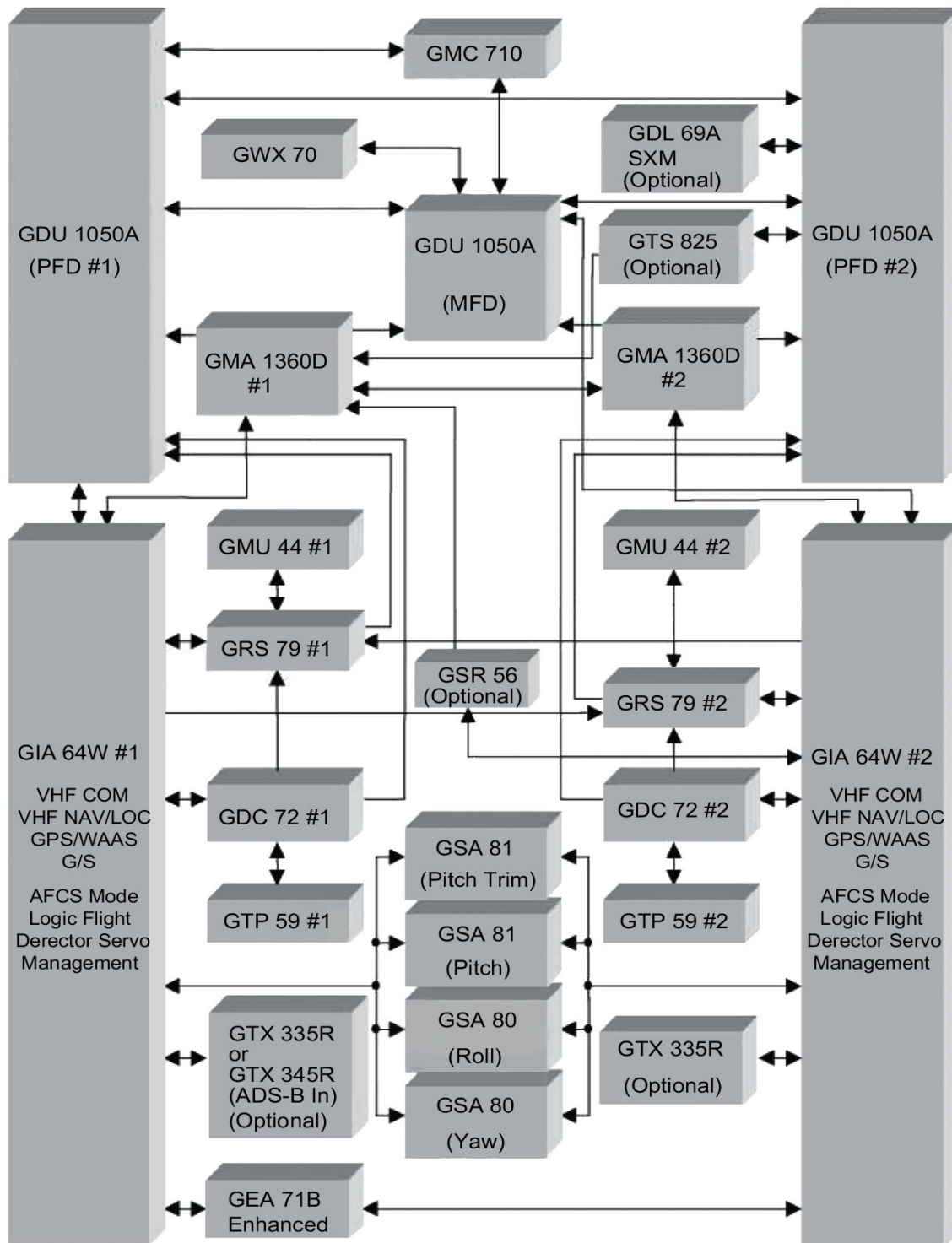


Figure 1 : Sheet 3 : Garmin G1000 Software Interface

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Garmin G1000 NXi Software Configuration (v.2499.08)

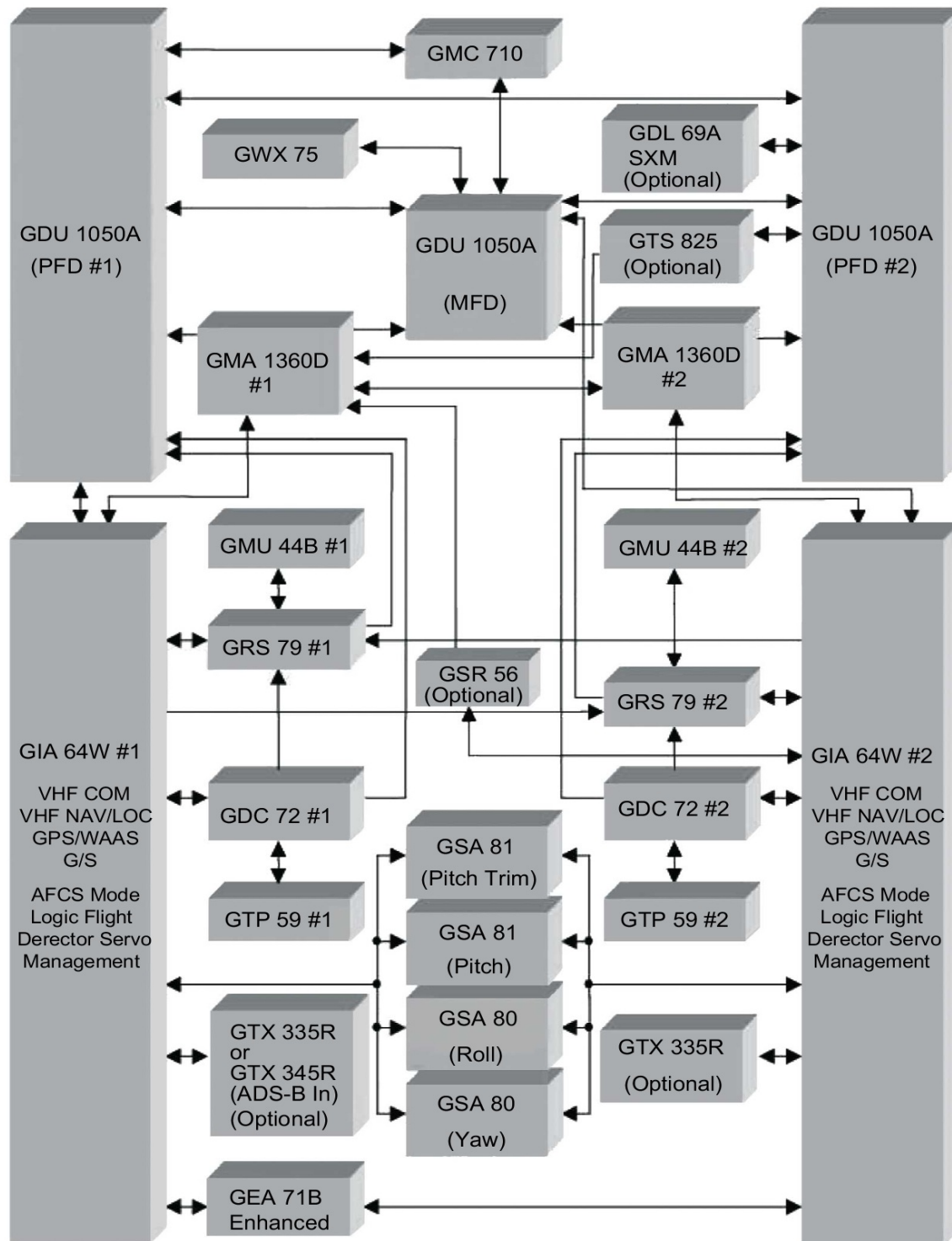


NOTE: AIRPLANES CAN HAVE DIFFERENT SUPPLIERS OF OPTIONAL SYSTEMS INSTALLED.

Figure 1 : Sheet 4 : Garmin G1000 Software Interface

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Garmin G1000 NXi Software Configuration (v.2499.10 and On)



NOTE: AIRPLANES CAN HAVE DIFFERENT SUPPLIERS OF OPTIONAL SYSTEMS INSTALLED.