

Introduction

The G3X CAN bus is a 22 AWG twisted, shielded pair of wires that runs around the plane and connects G3X devices to this common data bus in a daisy-chain fashion.

The CAN bus is very simple and normally very reliable, but if problems are occurring, there is a good reason and the following steps can help to identify the issue.

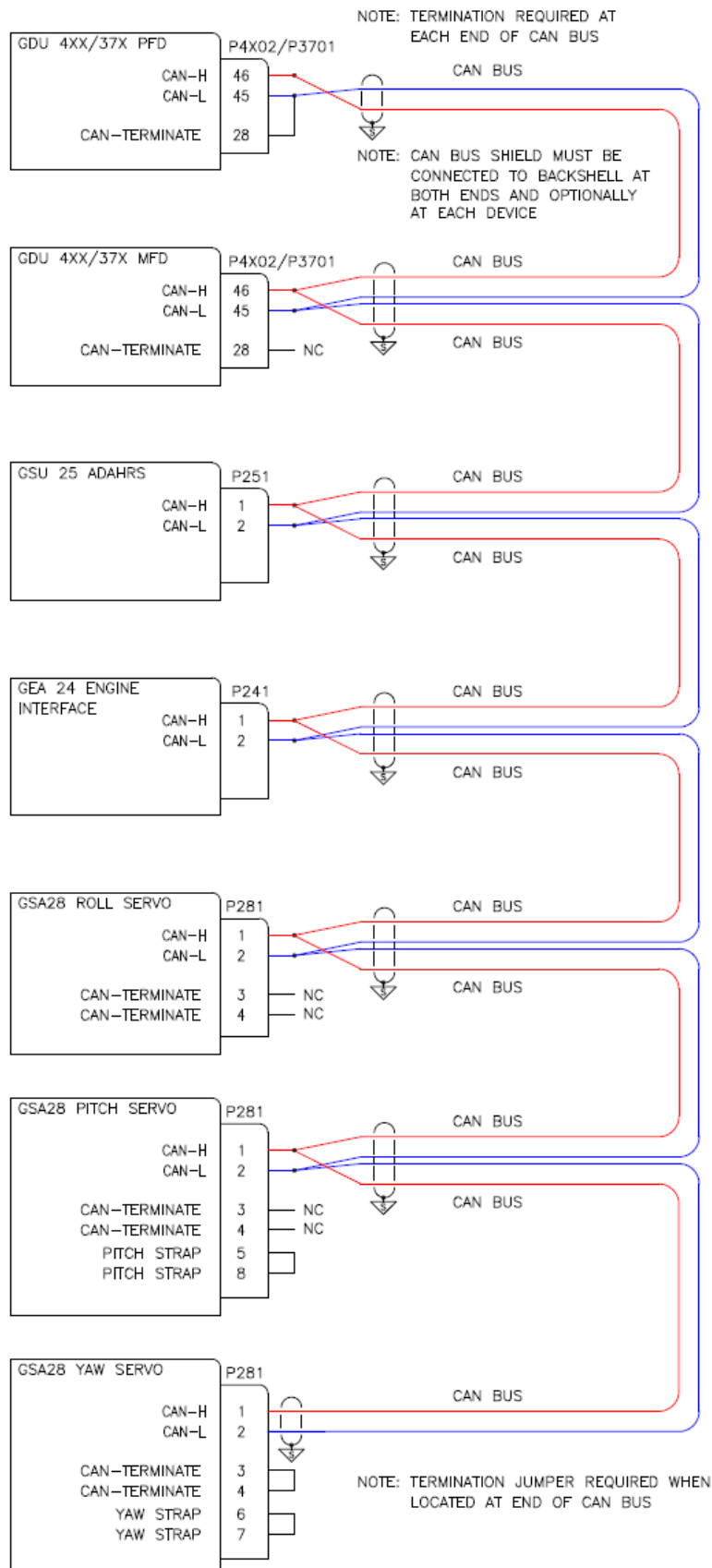
Troubleshooting Tips

1. Review the status LED of devices on the CAN bus such as the GSU25, GEA24, and GSA28 servos. When each device has a flashing green light it is powered and communicating.

LED Indication	Description
No Light	No Power
Steady Green	On, but not communicating via CAN bus
Flashing Green	On and communicating via CAN bus
Red	Hardware Fault
Alternating Red/Green	CAN bus network error indicating that two similar devices are configured with the same unit ID (e.g. two servos configured as the roll servo)

2. Make sure that the CAN bus is daisy-chained from CAN device to CAN device around the system and that CAN devices are not connected via a single point like a star or routed through a hub device. This can cause unwanted signal reflections and “orphan” some devices on the bus and prevent their communication. The diagram on page 3 of this document should help explain the meaning of “daisy-chain”.
3. Make sure the CAN bus is terminated only at 2 places and only at the extreme ends of the CAN bus. The diagram at the end shows some examples of CAN bus terminations. A termination simply places 120 ohms across the CAN Hi and CAN Lo wires.
4. With power removed, remove a connector from one device on the CAN bus (not a device at either end) and meter across the pins associated with CAN Hi and CAN Lo. Verify that it reads 60 ohms. This will verify that the CAN backbone is properly terminated at each end (two 120 ohm terminators in parallel). A CAN bus which reads 120 ohms is missing one of the two required CAN terminators.
5. Verify that CAN Hi and CAN Lo signals are not crossed on any connector and that neither signal is shorted to ground which can happen when shorted to the CAN shield braid.
6. Power up only PFD1 and each of the single CAN devices at once and verify that communication is strong (0% CAN error rate on config mode system information page with device highlighted). Sometimes a device will communicate with PFD1 when it is the only powered device on the CAN bus when some of the above issues are present
7. Verify that a fully powered and operating system has a steady state 0% CAN error rate for each device as shown on the config mode page (Config Main page for GDU 37X, System Information page for GDU 4XX).
8. Note that it is very important that each device on the CAN bus share a common power/signal ground. Ground differences between devices on a CAN bus can cause communication errors. Ground devices to a common ground bus, not to the airframe or multiple grounding buses.

Multifunction Display 1 Info		
Product Name	GDU 465	
Unit ID	3875290864	
System ID	60002E6FC3EF0	
System Software	006-B1727-01	4.10
Boot Block	006-B1727-00	2.10
Network Error Rate	✓	0%



Using Advanced CAN Bus Diagnostics

On a G3X Touch system with GDU 4XX displays, you may enter Diagnostic Configuration Mode during PFD1 display startup by holding down both the MENU and NRST buttons. This allows additional CAN diagnostic information to be displayed.

In addition to the CAN Network Error Rate shown in normal configuration mode, 4 additional network diagnostic even counters, shown below, are provided.

For a system with a healthy CAN bus, these counters should not be incrementing (as shown below). If these counters are incrementing, one or more of the issues identified on the first page of this document will likely need to be addressed.

COM Radio Info		
Product Name	GTR 20	
Serial Number	2QP000040	
Active Frequency	123.000	
Standby Frequency	121.225	
Network Error Rate	✓	0%
Network Tx Warning	-	
Network Rx Warning	-	
Network Error Passive	-	
Network Bus Off	-	
System Software	006-B1788-01	2.70
Boot Block	006-B1788-00	2.00
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