

MIL-STD-1553 Umbilical Separation

Application Note

AN/257

A problem that occurs in separable stages in launch vehicles is an open bus or stub at the time of separation. One solution to this problem is the use of a 2P2T bus relay (North Hills P/N DBR2000) as shown in Figure 1A and 1B. The idea is to reconfigure the critical bus(es) into valid bus configurations by physically disconnecting from the exposed open leads and switching in a proper termination.

There are two conditions that may exist. Either both sides of the point of separation must maintain bus integrity or only one side must.

In the first case, shown in Figure 1A, bus traffic into and out of the store or vehicle bus is a pre-launch condition only and once the separation occurs, bus traffic in the store ceases. An example of this is where store configuration and fuse settings are established at pre-launch and once separation occurs there is no further bus traffic. The bus is dead and its configuration is no longer important.

In the second case, shown in Figure 1B, both sides of the umbilical maintain post separation bus traffic. An example of this is a smart store where immediately before separation a back-up bus controller, located in the store or launch vehicle, is activated to establish a valid post launch data bus. Immediately after separation the aircraft or launcher data bus controller comes back on line, reestablishing the integrity of that bus.

In both cases the bus switching relays are energized just prior to umbilical separation by the aircraft or launcher controller.

One consideration that must not be overlooked is how to reestablish the original bus configuration in the case of an abort after the establishment of the in-store or vehicle bus controller. There must be a method for control to revert to the aircraft or launcher bus controller so safe shut down procedures can be instituted.

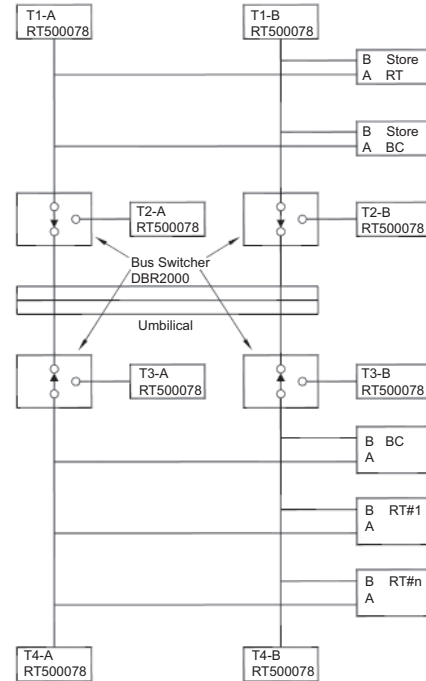


Figure 1. Post Separation Traffic on Both Buses.

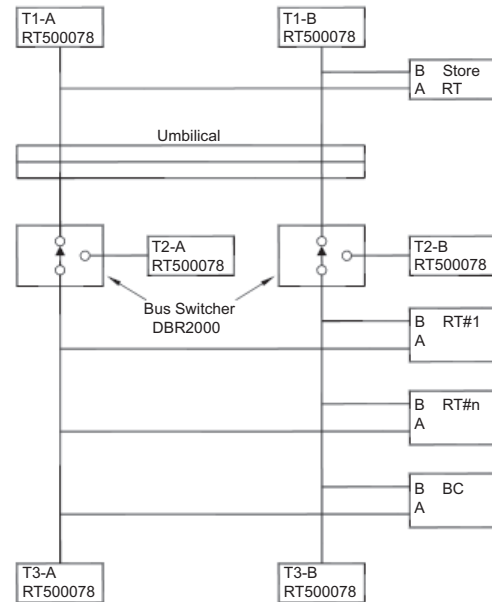


Figure 2. Prelaunch Only Traffic on Store Bus