

MIL-STD 1553 Testing

MIL-STD 1553, Aircraft Internal Time Division Command/Response Multiplex Data Bus, is a military standard, 1 Mbps serial communication bus used to achieve aircraft avionic integrations. DIT-MCO currently offers two different types of 1553 testing, *Dynamic* and *Functional* testing.

Dynamic Testing

Dynamic testing involves testing the integrity of the wiring and associated transformers of the bus network. Most of the tests are dynamic in nature, but before testing begins, one wire of the pair is tested for a connection to the shield ground. If this test passes, one stub transmits the data and another receives it. The data returns to the sending stub where it is checked for correctness and errors reported. During this time, another receiving device on the inactive bus monitors for voltage fluctuations due to crosstalk from the active bus.

A small suitcase type test box houses an interface section, a short to ground tester, a remote terminal type device, and terminator networks. Each box contains enough switching to connect to one of twenty-four stubs and interconnect in a daisy chain manner using standard RS-422 communications levels.

Functional Testing

The other method of testing the 1553 bus involves a MIL-STD 1553A/B bus simulator card that simulates avionics devices connected to the data bus. The card functions as either a bus controller simulator, a bus monitor, or a single or multi-remote terminal simulator, with the ability to induce and detect various types of errors. This type of simulator allows you to connect actual devices to the bus, address them, and compare the responses to verify correct data transfer.

For this application, access to a purchased 1553B bus tester/exerciser is available from the RS-232C port of the T81 control computer. The T81 SYS directive transfers control to the external bus tester, executes a programmed list of operations, and acquires the expected results. The program then compares the results. At this point T81 resumes control and transfers the results to the error log.

