

# TEST SYSTEMS, Inc.

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## MIL-STD-1553 SEMINAR LAB SESSIONS

The Lab Sessions are an integral part of the MIL-STD-1553 Seminar and are designed to provide the students with a demonstration of 1553 communication and “hands-on experience” in trouble-shooting remote terminal problems.\* There are two one-hour Lab Sessions for each student. Lab stations are set up with two to four students at a lab station. Since the number of students in each Lab Session is limited, the instructor is able to provide personal assistance to the students.

In the first Lab Session a bus scenario of six (6) non-broadcast messages is used to demonstrate 1553 communication and illustrate the material being taught in the Seminar. Using an oscilloscope, the individual command, status and data words of the messages are viewed and the formats are identified. The bits of command words are decoded to identify the various fields of terminal address, transmit/receive bit, subaddress/mode and data word count/mode code. Pulse widths, response times and intermessage gaps are measured as specified by the 1553 standard. RT-RT transfers are distinguished from BC-RT and RT-BC transfers. The order in which the command, status and data words are transferred and the number of each are identified. Mode Commands are distinguished from other commands and their functions are identified.

The “hands-on experience” in trouble-shooting remote terminal problems is provided in the second Lab Session by simulating various problems in nine of the ten remote terminals simulated. By creating and sending messages to a remote terminal the problem with the remote terminal is identified. Using an oscilloscope in combination with 1553 test equipment, the student gains valuable practice in trouble-shooting problems and applying the material taught in the Seminar.

The greatest value of the Lab Sessions is the involvement of the student with the concepts being taught. Interaction is accomplished by providing the student with a view of what is actually transpiring on the bus. Using the oscilloscope, the student moves from words on a page to actually seeing how bits are encoded, how word formats differ and what a sequence of messages looks like. The student actually experiences the trouble-shooting process in identifying problems in remote terminals. Because a picture is worth a thousand words, the Lab Sessions will help the student gain a greater understanding of MIL-STD-1553.

\* For In-Person Lab Sessions, the instructor looks over the students’ shoulders with their hands on the equipment, guiding them as they do the lab exercises. For On-Line Lab Sessions, the students look over the instructor’s shoulder with the instructor’s hands on the equipment and tell him what to do for the lab exercises.