

**OPERATION AND MAINTENANCE MANUAL**  
**for the**  
**JOINT PRIMARY AIRCRAFT TRAINING SYSTEM (JPATS)**  
**FLIGHT TRAINING DEVICE (FTD)**  
**CONTRACT FA8621-15-D-6258**  
**TASK ORDER #FA8617-17-F-6230**



**Revision 2**

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**LIST OF EFFECTIVE PAGES**

Note: A vertical line in the outer margin of the page indicates the portion of the text affected by the changes. Changes to illustrations are indicated by miniature pointing hands. Changes to wiring diagrams are indicated by shaded areas. Change bars indicate all changes, except formatting, made since the previous revision.

Dates of issue for original and changed pages are:

Original.....0.....31 August 2018	Re-baselining for second time; Original issue: July 2001; Change bars mark those changes at the time of re-baselining for clarification of new/revised material but will not be annotated in footers or on this page: Corrects reference in 5.7.3.6 (10); Removes rudder cable information from 5.7.3.7; updates figure numbers and PowerTools screen grabs in Section 5; adds installation instructions for substitute actuators and networking projectors; adds troubleshooting steps for projector network connectivity
Revision.....1.....17 October 2018	Modifies DDF file instructions to include toe break actuator-specific information; Adds installation instructions for substitute toe break actuators
Revision.....2.....29 November 2019	Incorporates IC1 (Section 5: inspection frequencies and RMU references). Adds information to Section 1 regarding facility-provided surge protection device.

TOTAL NUMBER OF PAGES IN THIS PUBLICATION IS 720 CONSISTING OF:

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## INTRODUCTION

This manual consists of two volumes. The first volume contains Front Matter, Sections 1 through 6, Appendices, and the Glossary and Abbreviations. The second volume contains the vendor support documentation, which means it contains material not controlled by FlightSafety.

This manual has been written to provide maintenance personnel with the necessary information to maintain the JPATS OFT, IFT, and UTD simulators. It is not the intent of this manual to document every conceivable type of maintenance requirement, but rather, the most common and most likely ones. It is not an Overhaul Manual, Instructor Manual, acceptance guide, or design document.

Each section of this manual has the table of contents at the beginning of that section. Because of different configurations existing concurrently at the various training sites, systems performing the same or similar functions will eventually have supplements addressing their unique maintenance requirements. The supplements will follow the same format as the O&M. This restructuring of the O&M will not be completed until December 2013 at the earliest. DAS II is the first component to have its own supplement.

Section 1 of this manual gives a top-level definition and description of the system components.

Section 2 describes preparation for use procedures for both the simulators and their components.

Section 3 describes the operation of the simulators and their various components.

Section 4 describes each system component's theory of operation as it pertains to the simulator.

Section 5 describes the recommended maintenance and maintenance procedures for the various system components.

Section 6 lists the applicable drawings referenced in this manual.

Appendix A contains commonly used electrical symbols.

Appendix B contains Electrostatic Discharge information and precautions.

Appendix C contains procedures for updating the FlightDeck I/O calibration table.

Supplement 1: DAS II contains all relevant sections of the O&M, Volume 1, in one volume.

This manual documents typical simulator configurations; always refer to engineering drawings and vendor data for specific information. Facility personnel are responsible for determining the actual configuration for each FlightSafety simulator.

## SAFETY SUMMARY

The following are general safety precautions and instructions that must be understood and applied during operation and maintenance of this equipment to ensure personal safety and protection of equipment.

### WARNING AND CAUTION STATEMENTS

WARNING and CAUTION statements have been appropriately placed throughout this text. WARNING statements occur prior to procedures, practices, or conditions considered essential for the protection of personnel. CAUTION statements contain information necessary to prevent equipment and property damage. A WARNING or CAUTION will apply each time the related step is repeated. Read and understand the WARNING and CAUTION statements before starting any task. Carefully observe all warnings and cautions within or preceding any procedural step in this manual for maximum personal and equipment safety.

### KEEP AWAY FROM LIVE CIRCUITS

Hazardous voltages are present within this equipment. Do not replace components or make adjustments inside the equipment with the electrical supply turned on. Under certain conditions, dangerous potentials may exist in circuits even with power controls in the off position due to charges retained by capacitors and inductors. To avoid injuries, always disconnect power and discharge capacitors and inductors before touching any parts.

### DO NOT SERVICE OR ADJUST ALONE

Under no circumstances should any person reach into or enter any enclosure for the purpose of servicing or adjusting the equipment unless another person is present who can render first aid and perform cardiopulmonary resuscitation (CPR).

### INTERLOCKS

This equipment contains interlocks for your protection. To ensure safety, always remove power from the equipment prior to opening access panels or doors. Do not depend on the interlocks or door switches when working with the equipment. Do not short-circuit or tamper with any access gate, door, or other safety interlock switch. When bypassing an interlock to trace a fault or correct a malfunction is absolutely mandatory, authorized maintenance personnel will perform the bypass for the specific test to be made. Immediately after completing the test, the interlock will be restored to working condition.

### JEWELRY AND LOOSE CLOTHING

Remove rings, watches, and other metallic objects to reduce the risk of shock and to prevent snagging on moving machinery. Do not wear loose clothing that could become entangled in moving machinery. Tie up long hair or tuck it under a cap while performing maintenance.

## CLEANERS, CHEMICALS, AND FLUIDS

Some cleaners, chemicals, and fluids have an adverse effect on skin, eyes, and respiratory tract. Observe manufacturer's WARNING labels. Use only in authorized areas. Unless otherwise indicated in the text, use of these fluids should not result in any immediate health concerns. In general, avoid prolonged skin contact and prolonged inhalation of mist or vapors. Wash affected areas with soap and water, and launder contaminated clothing. Some fluids become very hot during normal system operation. Use caution when disconnecting fluid lines and allow the system time to cool before performing maintenance. Finally, make sure firefighting equipment is readily available and in working order.

## FLUIDS AND THEIR DISPOSAL

Handle fluids carefully during disposal to avoid any caustic or acidic reactions that would harm staff, equipment, and property. Read and follow supplier guidelines for handling fluids. Spilled fluid might create a hazardous-materials (HAZMAT) incident requiring a carefully prescribed clean up. Fluids at the end of their useful life must be disposed of or recycled in accordance with local procedures.

## DANGEROUS PRESSURES

Pressure system precautions apply to all ranges of pressures. Take care during testing to make sure all connections are proper and tight before applying pressure to any system. All systems components must be compatible with pressures applied. Compressed air propels particles; direct the air stream away from personnel. Air pressure must be reduced to less than 30 PSIG and used with effective chip guarding and personal protective equipment.

## ELECTROSTATIC DISCHARGE

This equipment contains semiconductor devices and circuit card assemblies that may be damaged by seemingly undetectable electrostatic discharge (ESD). Take care when handling and repairing these items. A reasonable level of device protection can be achieved by using a grounded wrist strap when handling ESD sensitive devices, working on an ESD protected workbench, and using ESD protective packaging for shipping and storing ESD sensitive devices. DOD-HDBK-263 provides detailed ESD guidelines.

## BATTERIES AND THEIR DISPOSAL

Handle batteries carefully at all times to avoid spills and any caustic or acidic reactions that would harm staff, equipment, or property. If a battery bursts, inflammable materials might ignite. Read and follow manufacturer guidelines for handling a battery. Batteries at the end of their useful life must be disposed of or recycled in accordance with local procedures.

## FIRE HAZARDS

The Instructor Operating Station (IOS) Fire Alarm Pull lever activates an audible fire alarm and visible strobe light atop the IOS. The Fire Alarm Pull lever is a standard fire alarm switching system.

## SIMULATOR SAFETY

Dangerous hazards exist inside and outside a simulator. Improper use and slow or incorrect responses during an emergency might damage the simulator or compound what might have been only minor damage. Use caution to avoid injuries. Information in this section intends to minimize injury and damage in the event of emergency.