



## GLOBAL AVIONICS TRAINING SPECIALISTS, LLC

### CONTROL DISPLAY SYSTEM / RETROFIT

### SYSTEM DESCRIPTION AND OPERATION

#### I. INTRODUCTION

##### A. System Description

The Control Display System for Retrofit applications (CDS/R) is centered around two integrated avionics computers (IC-1080s). The ICs collect data from other aircraft systems and organize that data to send on to the DU-1080 display units.

The display units are liquid crystal displays (LCD) and contain circuitry and software that format the data for display. This configuration reduces the number of aircraft line replaceable units (LRUs) by housing multiple independent functions in single LRUs.

The configuration module stores data about the specific aircraft configuration. This information is read by the system at power-up and the displays are formatted accordingly.

During normal operation, the Control Display System for Retrofit displays the following data:

- Heading
- Course
- Radio bearing
- Pitch and roll attitude
- Altitude
- Airspeed
- Vertical speed
- Radio altitude
- Course deviation
- Glideslope deviation
- TO-FROM indications
- DME indications
- Groundspeed
- FMS maps
- Weather radar
- Enhanced Ground Proximity Warnings
- TCAS

Annunciators across the top of the Primary Flight Display (PFD) indicate selected flight director modes. Pitch and roll flight director steering commands are displayed on the PFD. This computed steering information directs the pilot to reach and/or maintain the desired flight path or attitude.

Operation of a specific system component by the IC depends on the system and other aircraft sensor data inputs. The IC uses software tests, in combination with built-in test (BIT) hardware to detect failures and determine input/output (I/O) signal validity. System monitoring is active in all modes of operation.

The Control Display System for Retrofit applications can employ two, three, or four flat panel displays that include Primary Flight Displays (PFD's) and a Multifunction Display (MFD). The displays are 8X10 inch in size.

An essential function of the Control Display System for Retrofit is information interchange in and between subsystems. Most of the information transfer is accomplished through the use of digital data buses. Some of the data transfer is accomplished in the form of discrete data. The data buses found in the Control Display System for Retrofit applications include;

1. ARINC 429
2. RS-232
3. Radio System Bus (RSB)
4. Digital Audio Bus
5. Serial Control Interface
6. Weather Radar Picture Bus
7. Integrated Computer Bus
8. Integrated Computer/Display Unit Bus (IC/DU)

The major Control Display System for Retrofit Sub-Systems are:

- Control Display System (CDS)
- Primus® II Integrated Radio System
- NZ-2000 Flight Management System
- Traffic Collision Avoidance System (TCAS)
- Laseref® III or IV Inertial Reference System
- Primus® 440/660/880 Weather Radar System
- Enhanced Ground Proximity Warning System
- Global Positioning System (GPS)

## **B. Course Objectives**

This course is designed to familiarize and prepare line maintenance avionics personnel to operate, troubleshoot, test and maintain the Control Display System for Retrofit and related sub-systems to the Line Replaceable Unit (LRU) level. The course is presented in conjunction with the CDS/R Pilot's Operating Manual, and the CDS/R System Description and Installation Manual and includes simplified block diagram analysis.

## **C. Arrangement**

Based on past experience, Global Avionics Training Specialists have arranged the subject material in an order best suited to continuity and ease of comprehension.

## **D. Duration**

The course is three days in length for a total of 24.0 hours.

## **E. Student Prerequisite**

It is recommended that students attending this course be avionics specialists or work on a daily basis on avionic systems and have a working knowledge of:

- Digital bus structures
- Flight deck displays
- Radio communications and navigation
- Long range navigation principles