Innovative
Solutions & Support

Cockpit/IP® for the Boeing 737 Flat Panel Display System Upgrade

Affordable Upgrade Solutions for the Classic B737

Integrated Flat Panel Cockpit Display System

Upgrading a cockpit can be an economical way to extend an aircraft's life, increase its residual value and bring efficiency and safety benefits to every day operations. Innovative Solutions & Support's Cockpit/IP® Flat Panel Display System (FPDS) is an easily installed upgrade for owners and operators of Boeing's Classic B737-300, -400, -500 aircraft. The system is designed to replace the legacy EFIS, reducing component count while using EFIS wiring. The FPDS unique design provides fuel savings through power and weight reduction, can reduce delays and cancellations through increased dispatch reliability (10-Day non-ETOPS) and provides enabling technology for future capabilities ensuring a state-of-the-art flight deck.

The IS&S Cockpit/IP consists of a pilot and copilot Primary Flight Display/Multifunction Display (PFD/MFD) suite, containing four (4) 6" x 8" Display Units (DU) and two (2) Display Control Panels (DCP) located in the center pedestal and two (2) 6 MCU Data Concentrator Units (DCU) installed in the electronics bay. By eliminating a number of older or obsolete components the Cockpit/IP, designed to support existing aircraft wiring, provides simplicity and flexibility allowing aircraft to be retrofitted within the window of a routine maintenance visit.

A primary consideration of the system design is replacing aging and obsolete equipment while maintaining compatibility with the functional legacy systems and equipment. The IS&S installation package has been designed to minimize wiring modifications in the electronics bay by utilizing the existing equipment racks and wiring connections. The unique design concept permits accelerated modification of graphic display formats, and as importantly, rapid certification.

The FPDS will meet your needs as mission requirements evolve and future technology changes at a rapid pace. The Cockpit/IP provides enabling technology for a path to support emerging technologies such as Required Navigation Performance (RNP), Enhanced and Synthetic Vision (EVS and SVS) and it will align to current and emerging OEM platforms.

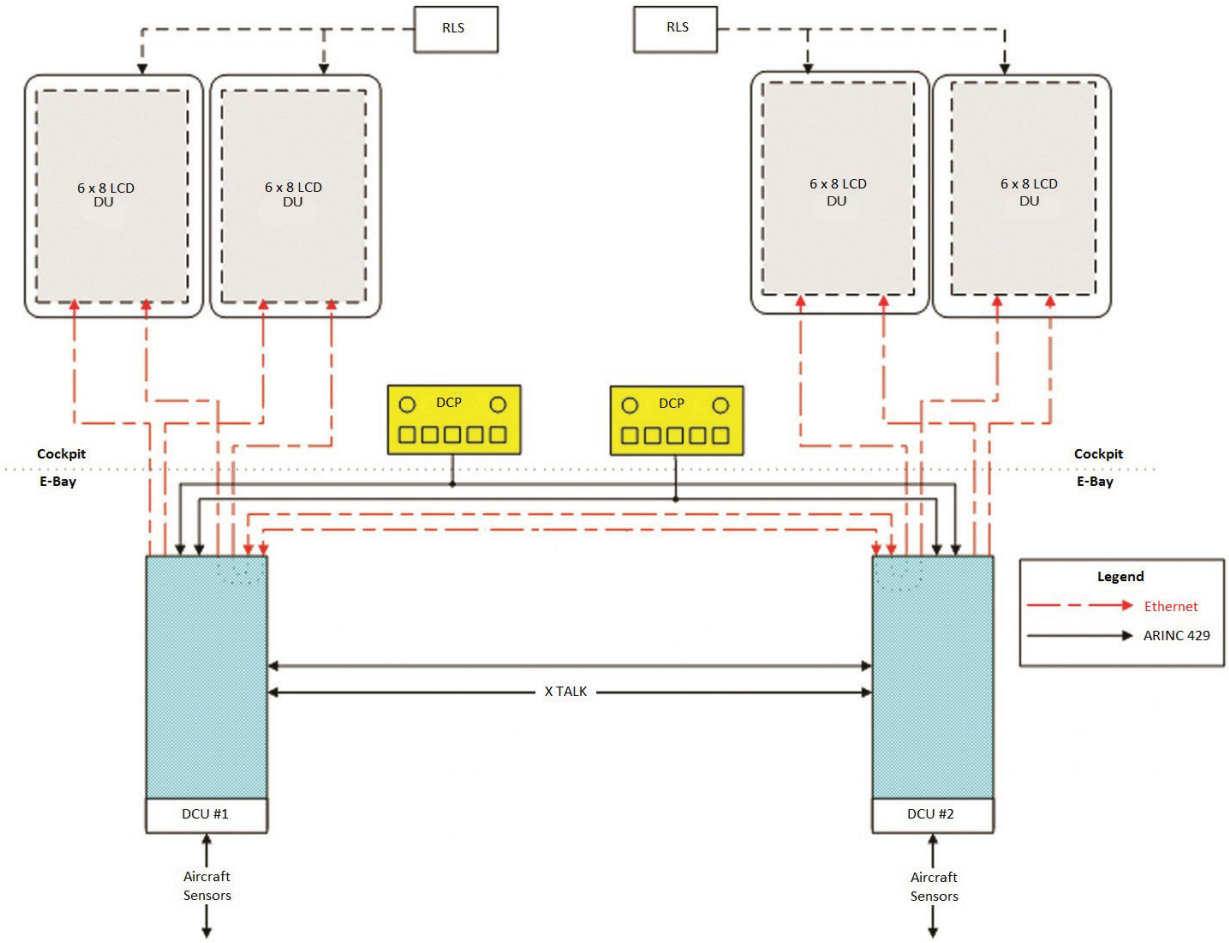
FPDS Features:

- ADS-B capable and CPDLC capable
- Class 3 forward field of view E-Charts
- Cross-side source selection
- Designed for minimal downtime during installation
- Fully redundant system with fault tolerant dispatchability
- EFB overlays on MFD
- Moving Map with satellite weather graphics
- Available Turn-key package provided with panels, harnesses, and equipment
- High resolution displays with LED backlighting
- Upgradable to NextGen and SESAR requirements

B737 EFIS

B737 with IS&S FPDS

FPDS Architecture:



The standard Primary Flight Display/Navigation Display (PFD/ND) format is based on industry standards and aligns the IS&S flight deck with new aircraft in production. Because of the available display area of the IS&S display units, the design goes a step further and provides the ability for flight crews to select expanded or centered (360 degree compass rose) information on the PFD unit. This feature allows pilots to select flight information, map, weather, traffic and terrain data for display on one or both primary flight displays to safely and efficiently fly an aircraft. This approach is certified with Level C dispatch relief approval, as detailed in the FAA Minimum Equipment List (MEL), to allow for aircraft operation with a display or display control panel failed. In the event of a PFD failure, the PFD image is automatically driven to the ND display without any pilot action necessary.

The IS&S Advantage

The IS&S Cockpit/IP replaces existing B737 EFIS displays and symbol generators with minimal wiring changes. The display system incorporates the functionality of the existing electromechanical altimeter, airspeed, RDMI and vertical speed instruments to minimize training.

Enhanced Readability

- High resolution multi-color LCD flat panel display
- Exceptional cross cockpit viewing angle
- Automatic luminance control

LRU Reduction

- LRUs (part numbers) reduced
- Component count reduced by 70%
- Logistics Savings

Improved Dispatch Reliability

- Digital electronics for improved accuracy and dependability
- Provides MEL Relief (Level C, 10-day)
- Can dispatch with failed DU or DCP
- Dual redundant channels in data concentrator
- Reduced down time and operation costs

Functional Evolution

- Flexible graphic symbology for user customization
- On-aircraft software updates
- Conforms to 737-600, -700, -800, -900 and BBJ presentations

Weight and Heat Savings

- Light weight design - removes over 100 lbs. in legacy equipment
- Reduced power consumption by 92 watts
- No forced air cooling required

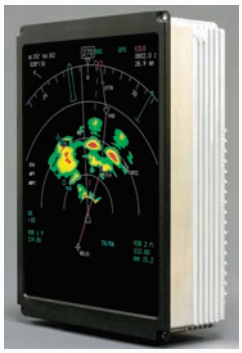
Minimal Pilot Training

- Human interface and display formats designed for minimal pilot differences training
- B-Level difference training program for B737 models

Options

- Expanded Horizon
- Maintenance Access Pages
- Live motion video
- Class 3 E-Charts with Ownship Position

System Specifications



Display Unit (DU):

Each DU is a self contained display unit with integral Symbol Generator Unit (SGU) and power supply processor, offering superior performance with the following features:

- High resolution (768 x 1024 pixels) XGA multi-color LCD flat panel display
- 6-inch x 8-inch (152mm x 203mm) active area (combined 12” x 8” display area)
- All digital electronics with improved accuracy, dependability and responsiveness
- Efficient backlighting for readability in bright sunlight
- Flexible advanced graphics processing
- Non-glare, anti-reflective display surface
- Highly efficient uniform display lighting design
- Built-in-Test
- DO-160D Environmental Qualification
- DO-178B Software, Level A
- Patented Zoom Feature

Display Control Panel (DCP):

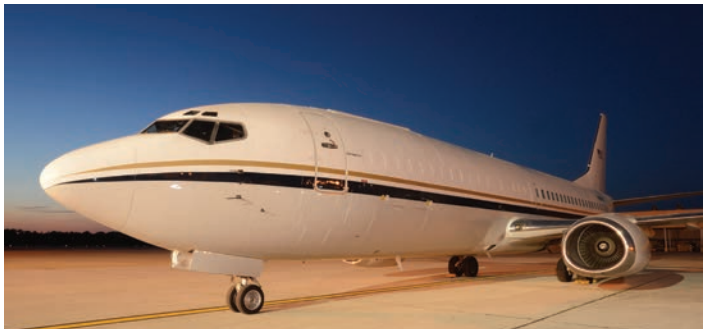
The DCP provides pilot/copilot inputs and transmits data to the Data Concentrator Unit on a low speed ARINC 429 bus. The IS&S DCP directly replaces the current DCP using the same connector:

- Speed Reference Settings
- Minimum Selection (Radio or Baro) Units Selection
- Barometric Altimeter Setting
- Flight Path Vector
- Meters Altimeter
- Navigation Display Range
- PFD/MFD and EGPWS/TERR Brightness Control
- Navigation Display mode
- MAP Display Overlay Selections

Data Concentrator Unit (DCU):

The DCU is capable of handling 38 ARINC 429 inputs and 19 ARINC 429 outputs; 4 channels of ARINC 708 data; and 96 discrete inputs and 16 discrete outputs. Each DCU is designed to directly replace the current symbol generators using the same mount and connector. The DCU replicates the existing instrument outputs, and interfaces with the following typical aircraft components (as applicable):

- Air Data System (ADS)
- Automatic Direction Finder (ADF)
- Distance Measuring Equipment (DME)
- Enhanced Ground Proximity Warning System (EGPWS)
- Flight Control Computer (FCC)
- Flight Management Computer (FMC)
- Inertial Reference System (IRS)
- Instrument Landing System (ILS)
- Mode Control Panel (MCP)
- Radar Altimeter (RA)
- Stall Warning Computer (SWC)
- Thrust Management Computer (TMC)
- Traffic Collision Avoidance System (TCAS)
- VHF Omni-directional Radio (VOR)
- Weather Radar (WXR)
- Windshear Computer (SWC)



B737 equipped with the IS&S FPDS

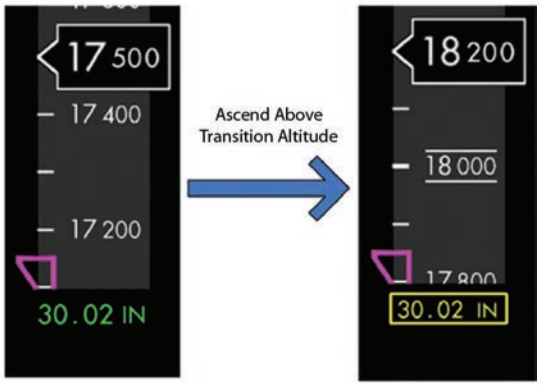
System Options - Software

PFD Format

- Baseline
- Expanded Horizon

Transition Altitude Alert

Display and alert of selected Barometric Transition Altitude.



Required Navigation Performance Scales

Expanded RNP Vertical Scales

- Customer defined options for Expanded Vertical Path Scale
- Magenta or Cyan pointer and CDI cue
- U Bracket or I Beam depiction
- Patented Zoom feature for VNAV Path Exceedance

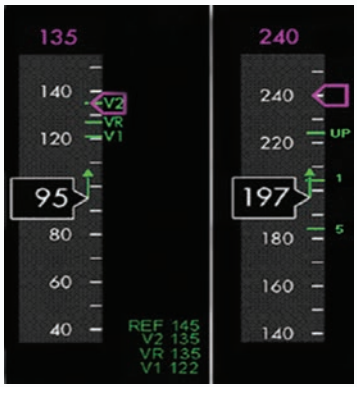
Chronograph

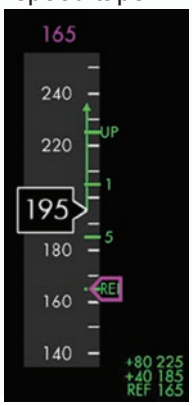
Remove mechanical Chronograph

- Displayed on PFD and ND Displays
- Interfaces with glareshield clock switch control

Flap Call Out

Display of flap position call out on airspeed tape:



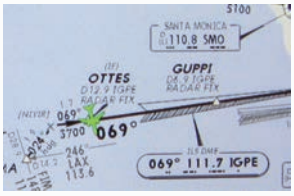


Cockpit Portal

Supports EFB Applications

- Charts with Ownship Position
- Video
- Electronics Checklist
- Satellite Weather

Level C Ownship Position



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IS&S is the world's leading supplier of RVSM systems and integrator of Cockpit Information Systems (Cockpit/IP®) for the Commercial Air Transport, Military, and Business Aviation Markets. IS&S incorporates leading edge technologies into sophisticated, cost-effective solutions for the aerospace industry.

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