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Solutions & Support

Flight Deck Upgrades for the P-3C

Affordable Upgrade Solutions for the P-3

Retrofitting the P-3 for NextGen Needs

Innovative Solutions & Support designed its CNS/ATM and NVIS-compliant Integrated Avionics Suite (IAS) to enhance the reliability, maintainability, and capability of the P-3. The IAS includes Primary Flight and Navigation Displays, Engine Instrument Displays, a Flight Management System, and an Integrated Standby Unit (ISU).

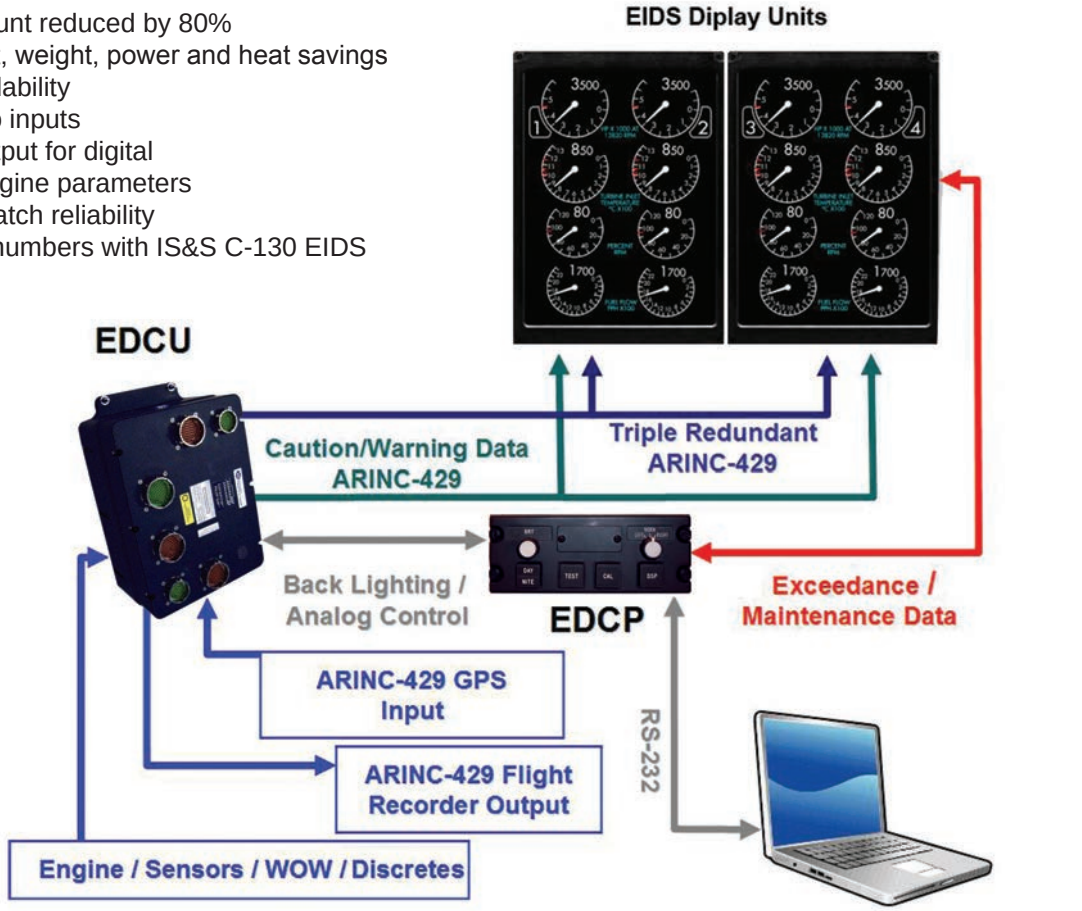
The IAS's unique design concept incorporates IS&S's phased approach to modular avionics modernization. Three primary phases of upgrade can implemented simultaneously or incrementally—in any order—as funding permits. IS&S's light weight, low-power designs boast exceptionally wide viewing angles, patented "zoom" features that enhance situational awareness, and proprietary heat sink designs that eliminate any need for forced air cooling.

Phase 1: Engine Instrument Display System (EIDS)

In continuous service since its introduction on the C-130 in 2004 the IS&S Engine Instrument Display System (EIDS) is a low-cost, reliable, and FAA TSO'ed/Certified replacement for the P-3 engine instrument cluster. Seamlessly installed into any existing P-3 cockpit configuration, the EIDS replaces individual electromechanical gauges in the P-3 engine cluster and digitally depicts all engine/propeller-related parameters and surface position indicators on two (2) high-resolution XGA AMLCDs. The EIDS readily provides an assured growth path to a complete P-3 Flight Deck upgrade.

Benefits:

- Component count reduced by 80%
- Significant cost, weight, power and heat savings
- Enhanced readability
- RGB/DVI video inputs
- ARINC 429 output for digital recording of engine parameters
- Increases dispatch reliability
- Common part numbers with IS&S C-130 EIDS



P-3 EIDS System Diagram

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Phase 2: Primary Flight/Navigation Display

The PFD/NDs replace the existing ADIs, HSIs, altimeters, airspeed indicators, and vertical speed indicators. Compatible with existing cockpit configurations, this upgrade presents all primary flight and navigation information on four LED-backlit smart displays. IS&S MCDUs add additional options and feature LCDs with available touchscreen functionality, standard keyboards, integrated mass storage, and Ethernet data loading capability.

The IS&S FMS is offered as an option to Phase 2. Mission-specific profiles, performance calculations, communications information, and airspace situational awareness are provided to the flight crew in an intuitive, familiar format. Flight crews can manually manipulate or datalink waypoint flight plans, routes, or user-defined waypoints within the FMS via the MCDU. Installed with IS&S's SBAS-capable Beta-3 GPS, the FMS provides full lateral and vertical navigation capabilities that include coupled LPV and CAT-1 SBAS approaches. Eight channels of ARINC-739 ports lay the foundation for meeting future CNS/ATM requirements by providing control of communication, navigation, weapons management and defensive aid systems.

Phase 3: Electronic Flight Bag

This system seamlessly integrates digital moving maps and charts with own-ship overlay into the Flat Panel Display System via the addition of a Map Server Unit.

Benefits:

- FAA Part 25 TSO Approved
- High Resolution XGA display with integral high performance symbol (graphics) generator
- Improved dispatch reliability
- Component count reduced by 80%
- Significant cost, weight and heat savings
- Adaptable to future requirements
- Meets MIL-L-85762A requirements
- Minimal changes to existing aircraft wiring
- Convection cooled - No forced air cooling required
- Low power LED backlighting
- Built in navigator station capability
- Shares common part numbers with IS&S C-130 Flat Panel Display System

Current Integrated Features:

- Digital Moving Maps
- Electronic Charts (En-route) with own-ship overlay
- Electronic Checklist
- Electronic Terminal Display
- Link 16
- Tactical Maps
- XM Weather

The IS&S Integrated Avionics Suite Advantage

In addition to affordability, the IS&S solution for the P-3 aircraft provides the following advantages:

Enhanced Readability

- High resolution multi-color LCD flat panel display
- Exceptional cross cockpit viewing angle
- Greatly enhanced sunlight viewability
- Broad brightness control range
- LED backlighting

LRU Reduction

- LRUs (part numbers) reduced
- Component count reduced by 80%
- Logistics Savings

Improved Dispatch Reliability

- Digital electronics for improved accuracy and dependability
- Dual-redundancy with reversionary display capability
- Enhanced combat survivability through triple redundant data processing channels.
- Reduced down time and operation costs

Platform for Growth

- User-customizable, flexible graphic symbology
- On-aircraft software updates
- Supports CNS/ATM and GATM requirements

Weight and Heat Savings

- Light weight design
- Reduced power consumption
- Forced air cooling not required

Minimal Pilot Retraining

- Familiar format reduces conversion training

Options

- Fuel quantity gauging
- Troubleshooting analysis
- Class 3 E-Charts with Ownship Position

Options

- Live motion video
- NVIS compliant
- Tactical Display

Integrated Avionics System Components

Display Unit (DU):

The self-contained Display Unit features a built-in symbol generator, multiple software-configurable processing units, and robust connectivity options. The low-profile 6” x 8” High Resolution XGA AMLCDs offer exceptional cross-cockpit viewing angles and readability.

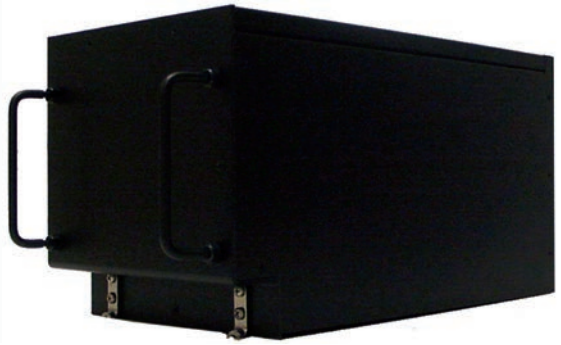
Control Panels

The Control Panels allow the pilot/copilot to interface with and manipulate the display environment. Control panels are Dzus rail width and vary in height according to assigned functionality. The complete system may include one or more of the following:

- Display Control Panels
- Supplementary Control Panels
- Engine Display Control Panel

Data Concentrator Unit (DCU):

The DCUs gather aircraft data via the following inputs: ARINC 429, ARINC 708, Synchro, Analog, RS422, Discrete and Ethernet 100 Base T. Outputs include analog and ARINC 429, RS422, Discrete, and Ethernet 100 Base-T. Each DCU is identical and provides independent channels which support a redundant set of data to each DU for display processing. The DCU replicates the existing instrument outputs, and interfaces with typical aircraft components.



Engine Data Concentrator Unit (EDCU):

The EDCU receives the necessary data from existing aircraft components and digitally replicates the look and feel of the analog gauges.

Electronic Chart/Map Server Unit (ECMSU):

The ECMS houses dual servers in a 4 MCU chassis. The first server is dedicated to hosting Jeppesen electronic charts, while the second is allocated to host Harris Digital Moving Map. Electronic chart/map functions are controlled via ruggedized hand controllers or display control panels. Chart/map information is displayed with own-ship overlay on either the Navigation or EIDS display units. Optional user-maintained electronic checklists are also managed through the ECMSU.

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Integrated Avionics System Components

Flight Management System (FMS):

Designed to deliver enhanced capabilities the FMS provides a reliable platform for advanced navigation with mission specific profiles, performance calculations, communications, and situational awareness essential for mission success. The FMS provides for full lateral and vertical navigation capabilities that include coupled LPV and APV approaches and includes up to eight channels of ARINC 739 ports for control of communications, navigation and defensive aids that are essential to meet CNS/ATM requirements.

Integrated Standby Unit (ISU):

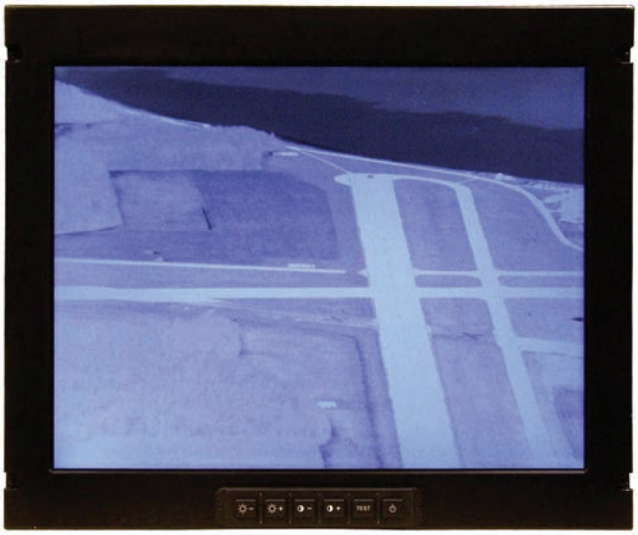
The ISU calculates, processes and displays altitude, attitude, airspeed, slip/skid, and navigation display information in a logical and concise single instrument display. The unit is designed to support additional enhancements for Radio Management and Alternate Navigation (ILS, VOR, DME, ADF, FMS, GPS) functionality.

An Innovative History With the P-3

IS&S has a proud history of providing Lockheed Martin with affordable and reliable P-3 Engine Indicators and Multifunction Mission Display panels. Over the course of the P-3's service it has featured the following IS&S systems:

P-3 TITI -Turbine Inlet Temperature

SHP -Shaft Horsepower Torquemeter



Large Flat Panel Multifunction Display

Innovative Solutions & Support products have been installed on over 250 P-3 aircraft worldwide. Military aircrews in more than 20 nations routinely rely on our avionics to safely execute missions in all conditions. IS&S has leveraged over 25 years of aerospace ingenuity and created a flexible, innovative Flat Panel Display System that exceeds today's standards and ensures your preparedness for tomorrow's missions.

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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