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HeliMedia
tactical surveillance and communications solutions

OVERVIEW OF A
LAPTOP AIRBORNE MISSION SYSTEM (LAMS)

Introduction

This document describes a new Laptop based mission system capability that is part of HeliMedia's VMB (Video Mission Box) product range. The contents of this document are commercially sensitive and are not for distribution. The concept and design described is owned by HeliMedia and cannot be reproduced without written consent or license from HeliMedia.

Requirements

With the minimum amount of hardware and lowest cost, provide an airborne mission system that supports the base level requirements of a typical airborne video capability

- Video display
- Video recorder
- Moving Map

Video recorder to support industry standard MISP-compliant Key-Length-Value (KLV) embedded metadata (STANAG 4609)
System is to be quickly deployable between aircraft and fully EASA approved.
System can be expandable to include other functionalities if required (eg microwave downlink, multiple displays).
To be compatible with all High Definition Wescam MX turrets.

Concept: LAMS

LAMS is based around a rugged laptop running a new mission system software package called AIMS-HD from Canadian company CarteNav. AIMS-HD provides operators with a real-time HD EO/IR display with mission data over-layed onto a digital moving map. The system interfaces with the Wescam via the Remote Control Subsystem (RCS) not just the Moving Map Interface (MMI) and consequently has the ability to control, steer and manipulate all features of the turret.

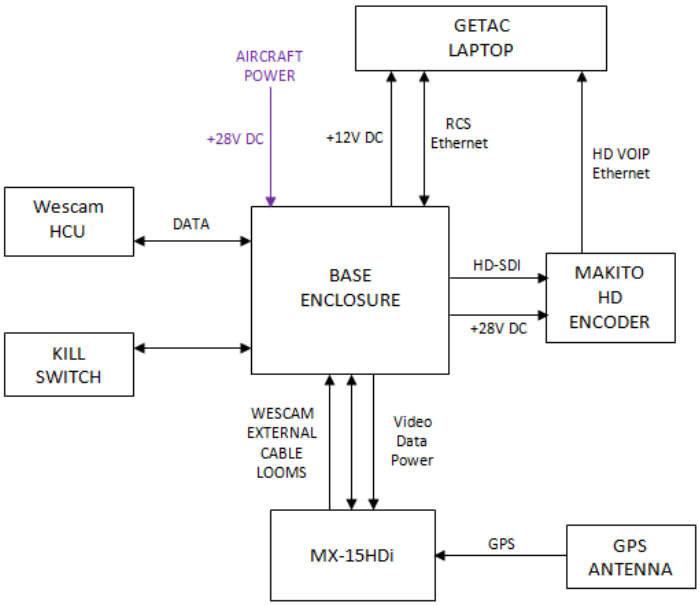
LAMS uses a fully rugged laptop from Getac on which the AIMS-HD software is run (The Getac model used is the X500). The HD video is supplied to the Getac in Video Over Internet Protocol (VOIP) format via an Ethernet cable. The Getac has a HD touch screen display, and AIMS-HD provides the moving map and video record functionality (the video is recorded to the Getac hard drive). AIMS-HD also records all of the mission data (aircraft positions, target positions, still images – all with metadata).

At the end of the mission, this data can be quickly downloaded from the Getac and processed by another system (eg USB file transfer), or the Getac can be removed and the data processed (either fully or in part) on the X500.

To convert the HD video from HD-SDI (which is what the Wescam turret provides) to VOIP, a standalone HD encoder called the Makito Air is used. This encoder delivers the required functionality (HD MPEG-2 + MPEG-4 encoding, low delay and MISP-compliant KLV metadata) in an aviation approved package (lightweight, +28V DC, DO-160 approved).

The other LRU is called the Base Enclosure. This takes the Amphenol connectors from the Wescam turret loom and separates out the various video and data signals. It also contains the auto-shed power supply unit, and DC-DC converter for the X500 power cable. The Base Enclosure is designed so that it can be expanded to include other hardware (such as a microwave downlink) if required.

The following diagram shows how these sub-systems are connected together to form the LAMS.

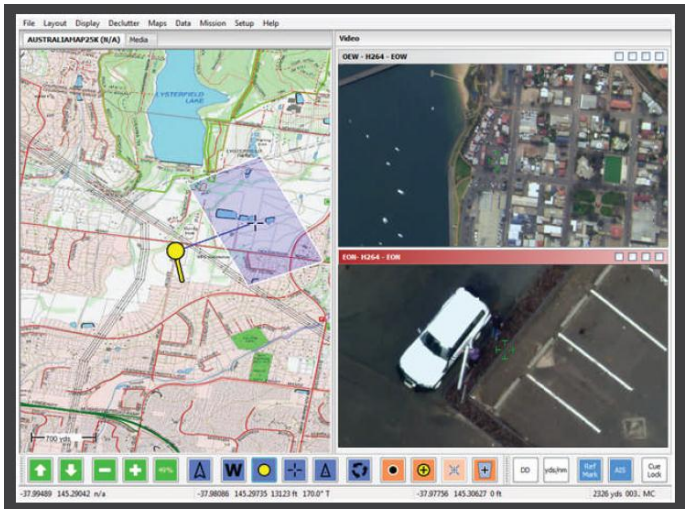


LAMS System Overview Diagram

AIMS-HD

AIMS-HD is a mission system optimised for the Wescam series of MX turrets. Interfacing with the turret via the RCS enables AIMS-HD to provide full camera control. Features include:

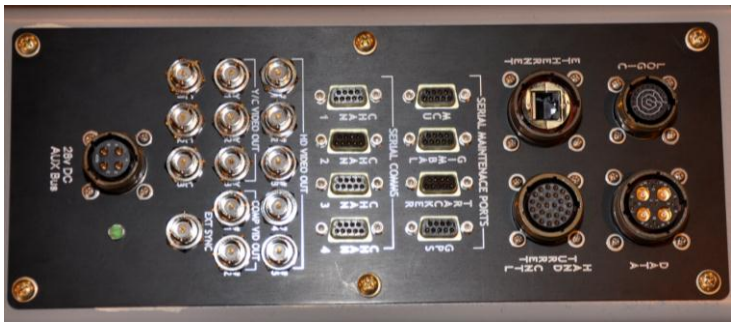
- Moving map display with world coverage topographical and hydro-graphic charts, and the unique ability to import raster or vector maps
- Provides precise camera cuing, full camera control, and a digital terrain elevation corrected map overlay of the camera's bore-sight position
- Integrated display, playback, and recording of STANAG 4609 compliant high definition and standard definition video with KLV metadata
- Capture and geo-rectification of high resolution still imagery from the video
- Intuitive and flexible user interface optimised for touch sensitive displays
- Street address lookup database and query utility
- All sensor, position and mission data is captured in a relational database. This allows for mission review (with video), and facilitates the export of mission data using open standards for exploitation by a wide range of third party applications
- Supports networking, which allows multiple clients to share mission data.



AIMS-HD Screen Shot

Base Enclosure

The base enclosure takes the three cable looms from the MX-15HDi and separates all of the video and data signals out, routing them to individual connectors on the top face of the enclosure similar to the connector panel for the MX-15HDi shown below. The Wescam hand controller unit (HCU) connects to the base enclosure. The base enclosure also houses all of the DC modules. This includes an auto-shedding power supply with an external kill switch and DC-DC converter for powering the Getac X500.



Example Connector Panel for the MX-15HDi

Standalone HD Encoder

Although the X500 can be fitted with a HD capture card, this only enables the HD video to be viewed in real-time. To support the record functionality the HD-SDI video from the Wescam needs to be compressed to a manageable data rate and supplied to the X500 as VOIP. Although there are numerous encoders that provide this functionality, for LAMS, the encoder needs to maintain very high picture quality with a very low delay, and be available in an aviation approved package.

The Makito Air encoder delivers on all of these key requirements, and is a world leading product in its class. It is manufactured by Haivision, a North American company, and the device has been used by Wescam and CarteNav in the development of AIMS-HD software.

Makito Air HD Encoder

Further Enquiries

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