

Video System Upgrade on Aerial Support Aircraft

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DEFENSE SOLUTIONS

Challenge

- Complete video system upgrade
- Simplified system architecture
- Lifetime system support

Solution

- Common display hardware platform
- SWaP optimized video management
- HD video recording

Results

- Reduced system complexity
- Reduced system weight
- Operator control from any display

Challenge

The rapid change in both sensor and video system technology in the last decade has pushed aircraft operators to evaluate their on-board surveillance equipment and system architecture. The aim is to maximize performance and reduce complexity, which in turn can reduce system weight and footprint enabling more features while giving operators more control over their video feeds. When an existing aerial support unit customer decided it was time to upgrade their system to reap the benefits of the latest available technology, they turned to Curtiss-Wright, already their trusted and proven partner.

The existing video system consisted of four displays, two video recorders, and a video distribution and conversion unit. This legacy equipment was over eight years old and when

originally installed, was configured to provide the maximum functionality the system had to offer. After years of in-service use, the operational unit identified that only a subset of this functionality was put to use and the system architecture was therefore unnecessarily complex. The result of this complexity was that every input and output was connected to cabling that was routed around the aircraft, taking up a significant amount of space and unnecessarily weighing the aircraft down.

During the evaluation phase, in addition to needing to retain key elements of the original systems' functionality, the customer also identified longevity of lifetime support of the system as a critical factor, making Curtiss-Wright an obvious partner to consider.



VRDV7000 Dual Channel
HD Video Recorder



AVDU Rugged LCD
Mission Displays

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Solution

Two of Curtiss-Wright's latest HD video recorders, the VRDV7000, replaced both of the legacy recorders, and four advanced video display units (AVDUs) replaced their existing displays. The AVDU provides a common hardware platform while replicating the functionality of their old system by utilizing its soft button and touchscreen controls. Curtiss-Wright were able to offer complete flexibility to the operators, to define the level of customization and configuration they required, for example, giving the operator camera and sensor control from any of the four screens via the resistive touchscreen display interface. Additionally, advancements in screen technology provide the operator with hugely improved visibility in a thinner, lighter unit.

Though some of the redundant features of the old system were removed, new features were added when replacing the legacy video distribution unit with digital and analog video switches from the Curtiss-Wright rugged video gateway (RVG) product line. Not only does the new analog switch enable continued use of legacy sensors but the digital switch interfaces with the new digital map software while providing full HD video to all the on-board displays. The RVG-SD1 (digital) and RVG-SA1 (analog) are amongst the smallest video switches available in the market. Naturally, this reduces system weight, while the crossbar architecture gives operators the ability to view different sources on their displays without impacting any other operators' imagery or video selected for downlink or recording. This feature enables the up/downlink to transmit video between aircraft, allowing for a handoff when an aircraft reaches the end of its endurance, to another aircraft in the sky. In this way the video recording is maintained throughout the mission, even in the case of a changeover in aircraft or personnel.

The continued support that Curtiss-Wright was providing on the legacy system fostered a relationship that enabled us to help the customer identify the optimum scope of an upgrade, while illustrating the benefits of such. We created a system architecture based on the latest technology available whilst removing unneeded features and reducing system complexity and weight.

Results

After extensive discussions about requirements and system architecture, in August 2018 the customer placed an order for a complete replacement video system. As part of the contract, their aircraft integration specialist visited Curtiss-Wright's facility in Letchworth UK for an on-site acceptance test. The system performed 100% as per the agreed requirements, achieving a 1st-time pass and on-time, on-budget delivery in December 2018.

By working closely with Curtiss-Wright, the customer leveraged fielded, proven COTS products to develop a custom system solution that met their unique requirements, within the agreed timescales while achieving the desired level of customer specific functionality. Through the continued support that Curtiss-Wright provided, a system architecture was created that both reduced system complexity and weight while also maximizing the necessary functionality for the application.



RVG-SA1 Analog
Video Switch



RVG-SD1 Digital Video
Switch

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