Mission Recorder with Secure Data Storage for Utility Helicopter

Challenge

- Simultaneously play and record video
- Protection of sensitive data-at-rest
- Confined space for electronics

Solution

- COTS video recorder and network attached storage
- AES-256-bit encryption
- Low SWaP solution

Result

- Integrated video and storage system
- Data-at-rest protection
- Complete system fit on deployed helicopter

Challenge

Many of today's defense and aerospace platforms must protect critical data-at-rest (DAR) from unauthorized access. A systems integrator faced this challenge while seeking a mission recording solution for a medium utility helicopter. This recording system was required to simultaneously play and record video while securely storing data in encrypted networked storage.

The system requirements included SWaP optimization and AES-256-bit data-at-rest (DAR) encryption to protect the space-constrained helicopter's sensitive, mission-critical information.

Solution

Curtiss-Wright worked with the system integrator to develop a solution to provide live-view mission data while simultaneously exporting the data to a separate secure network-attached-storage (NAS) device. A unique solution aligned with the program requirements was developed by combining the video management capabilities of the VRDV7000 video recorder with the encryption capabilities of the DTS1 CSfC NAS.

The HD video mission data is sent directly to the VRDV7000, where it is recorded in the small form factor (5.7 x 4.5 x 1.5 in or 146 x 115 x 38 mm), lightweight (1.7 lb or 0.75 kg), ruggedized digital video recorder. The recorder uses MPEG-4 Part 10 (Advanced Video Coding)/H.264 video compression technology to provide high-quality video recording at a bit rate that allows many hours of recorded video to be stored on a Secure Digital™ (SD) card or a USB flash drive. With simultaneous playback and recording, as well as front panel, serial, or Ethernet control, VRDV7000 operators can easily watch previously recorded video while continuing to record live video.

After compressing the video data, the VRDV7000 also sends that data via gigabit Ethernet (GbE) to the DTS1. The DTS1 encrypts and stores this data on its removable memory cartridge (RMC). The hot-swappable RMC is easily removed from the DTS1 and is small enough to fit in a shirt or flight suit pocket, making it convenient to transport between locations for post-mission analysis. With dimensions of 1.5 x 5.0 x 6.5 in (38 x 127 x 165 mm) and weighing only 3.1 lb (1.4 kg), the DTS1 is SWaP optimized for space-constrained environments.

Results

Curtiss-Wright and the customer jointly developed a solution to meet the unique program requirements while minimizing SWaP and protecting critical data. Seamless integration of the VRDV7000 and DTS1 made it simple for program compatibility and mission objectives to be met. The small form factor DTS1 and VRDV7000 increased mission efficiency, while AES-256-bit encryption protected the data during and after the mission.

The simultaneous recording, playback, and storage of the combined system and the large storage capacity meant data was available to both the operators and data analyzers when and where they needed it.

Figure 1: VRDV7000: HD video recorder

Figure 2: DTS1: Encrypted network attached storage