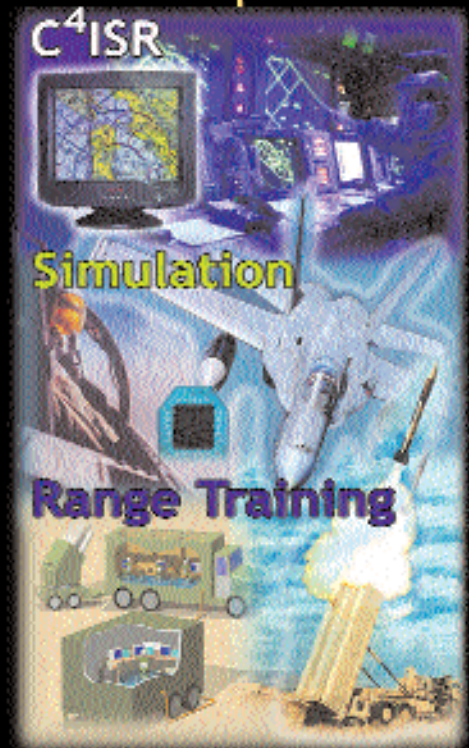


AP Labs

digital video systems product overview

September 2005

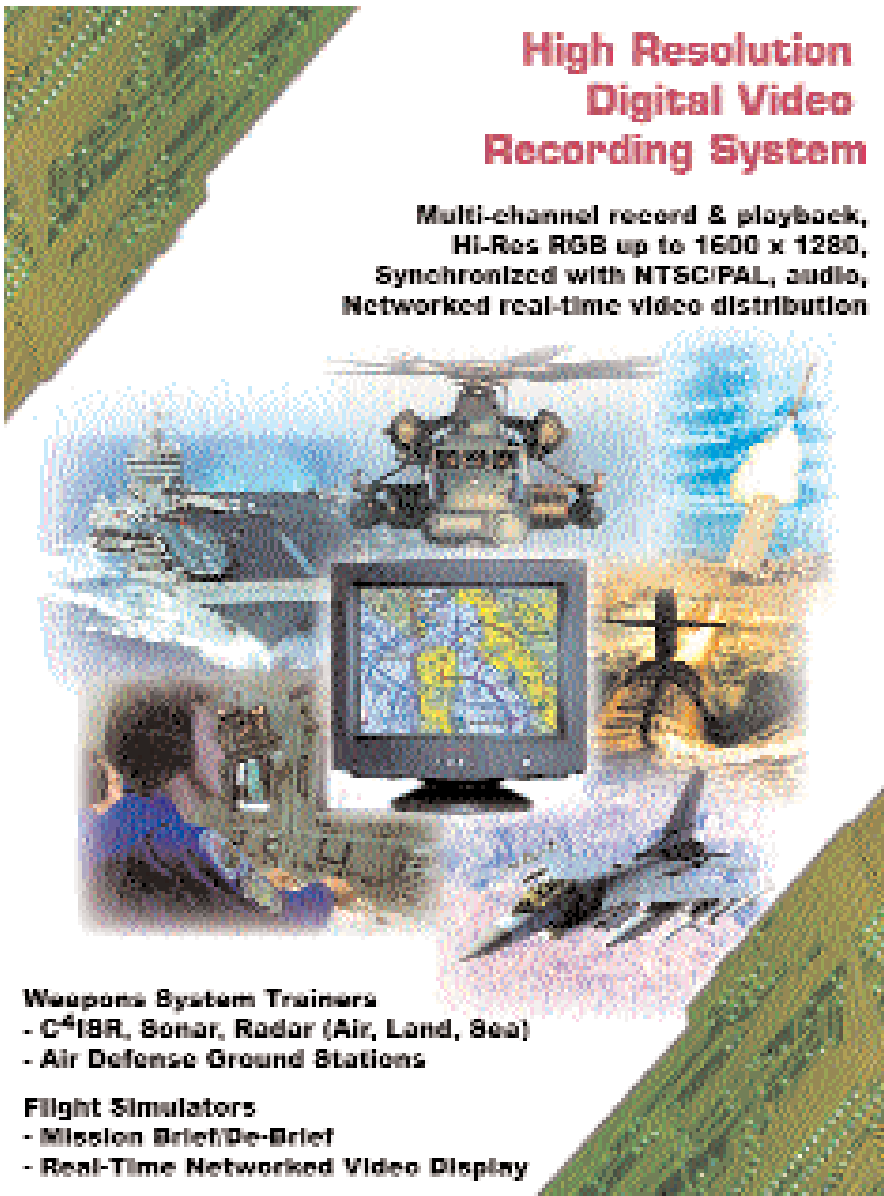


Multi-Channel Digital Video Record/Replay
Hi-Res RGB, NTSC/PAL, Audio
Options for Serial RS-232/RS-422, MIL-STD-1553 Data Streams
Networked Real-Time Video & Audio Distribution
Standalone System or API-controlled subsystem

- Rugged Enclosures
- Integrated Systems
- Manufacturing Services

High Resolution Digital Video Recording System

Multi-channel record & playback,
Hi-Res RGB up to 1600 x 1280,
Synchronized with NTSC/PAL, audio,
Networked real-time video distribution



Weapons System Trainers
- C⁴ISR, Sonar, Radar (Air, Land, Sea)
- Air Defense Ground Stations

Flight Simulators
- Mission Brief/De-Brief
- Real-Time Networked Video Display

High resolution workstation displays and standard NTSC/PAL-type video streams are commonplace in today's high performance military and aerospace applications. In operator/pilot training and system test environments it is often necessary to accurately record what is seen on these screens, what is heard on audio channels, and potentially what was happening on other data "streams".

Application requirements vary - from a need to record a single RGB screen up to projects requiring multiple channels of RGB video, NTSC/PAL inputs, audio, and more, all synchronized with GPS or IRIG time. The AP Labs digital video record/replay system was designed to handle this wide range of technical requirement in a cost-effective way.

Built on a modular, layered hardware and software architecture, the flexibility of the AP Labs system offers a solution that can fit almost any customer's requirements. For something ready-to-run and record/replay video on the first day of delivery, AP Labs offers a standalone system. For existing simulation/training applications which need enhanced video record/replay capabilities, AP Labs offers a subsystem designed to be controlled by the customers' system via a standard network interface. And for Mission Brief/Debrief systems needing full-up network-based control and archival/replay of multiple streams of data, AP Labs offers a complete solution.

AP Labs has been in the business of solving customer's real-time and data system needs for 20 years - we would be happy to discuss the details of your requirement at any time.

KEY FEATURES include:

- real-time system hardware and software guarantees the acquisition and recording of critical test data
- portable JAVA-based setup, control, and display software for a ready-to-run turnkey system, OR - software API for control by the customers' system
- real-time video TCP/IP network distribution during recording or playback
- non-intrusive acquisition of system-under-test video and other data
- programmable frame rates and compression ratios on a per-channel basis
- non-standard video formats and aspect ratios supported
- software development kits available, enabling support of standard software or custom enhancements either by the customer's engineering organization or by AP Labs
- flexible packaging options, from small portable systems to large fully-integrated rack systems



Core Real-Time Hardware and Software Components of the AP Labs Digital Video System Solution

HSDRS: High Speed Data Recording System

HSDRS is the data acquisition "engine" of the AP Labs system solution. The base real-time hardware and software architecture are comprised of COTS industry standard components. The HSDRS supports the acquisition of a wide range data inputs, including:

- Hi-Res RGB (up to 1600x1280 @ 76Hz), DVI
- NTSC/PAL, Composite or S-Video
- Serial Communications (RS-232, RS-422 interfaces with support for standards such as ATDL-1, FDL, TADIL-J, etc), and
- MIL-STD 1553

Additionally, HSDRS supports the time-stamping of data streams via GPS or IRIG inputs. Data is stored on industry standard SCSI disks, which can be fixed or removable. Autobooting and auto-recording modes are supported for unattended operation.

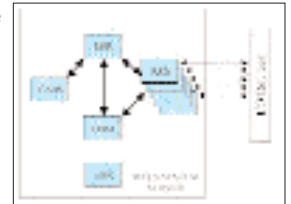
The HSDRS can be controlled by the AP Labs-supplied HSDRS Control Client (HCC) software application, described below. Alternatively, customer-furnished systems can use the standard network/socket-based Application Programming Interface (API) to communicate with and control all features of the HSDRS.

The HSDRS can be packaged in variety of lab, industrial-grade, or rugged enclosures. Some typical examples are shown above. They are (from left to right): the FS-4008 8-slot portable enclosure, the FS-7276-HSDRS rugged 8-slot ATR-style enclosure, and the 12-slot FS-1220 19" rack-mount industrial-grade enclosure. Call for other options, including conduction-cooled versions.



DS2: Data System Server Software

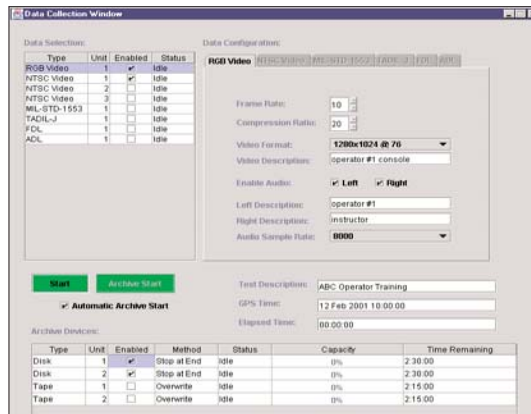
The HSDRS system software is based on DS2 - the AP Labs-developed open-architecture real-time control software which controls the data acquisition process within the system for one or more streams of video, audio, and other system data. DS2 includes a well-defined socket-based Application Programming Interface (API) to allow control by AP Labs and customer-supplied client programs. DS2 is a very modular product, and components of DS2 have been used on Windows, Linux, and Unix-based systems.



Client Control, Display and API-Controlled Video Server Applications

HCC: HSDRS Control Client Software

The HSDRS Control Client (HCC) software is a JAVA-based GUI application designed to run on standard workstations. HCC provides easy-to-use point-and-click menus for setting up and controlling the operation of one or more HSDRS systems. GUI access to control the acquisition, storage, replay, and extraction of data streams is supported. HCC is primarily used in "stand-alone", turnkey applications.



DVP: Digital Video Player

The DVP application controls the display of video and audio on a standard PC, utilizing a familiar "VCR-style" interface. Video can be viewed "live" during real-time acquisition by the HSDRS (via a standard TCP/IP socket connection). Post-test, the video can be replayed from the HSDRS or the local PC file system - the VCR controls then offer the ability to play in forward, reverse, fast forward & reverse, or the video can be stopped and stepped on single frames. Seeking to a time-stamp and export of frames to JPEG snapshots and video clips to a standard .avi format is supported.

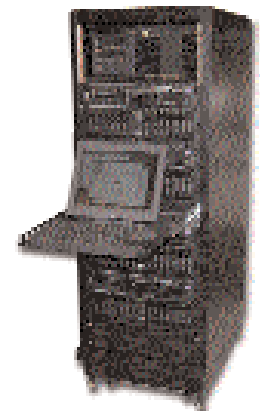
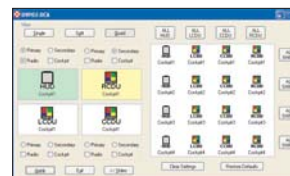


API-Controlled Video Server Applications

There are many applications in the field where an existing computer system must be used to control the operation of the HSDRS - for example from an existing Mission Brief/Debrief System. In these cases the HSDRS can be controlled through its socket-based Application Programming Interface (API). Full documentation and support can be provided to enable customers to take full advantage of the HSDRS industry-leading performance.

In addition to using the HSDRS to capture and compress video, AP Labs has supplied cost-effective PC-based server/RAID technology for the storage and simultaneous replay of multiple video streams.

For Example - Flight Simulation - cockpit display (HUD, MFD etc.) and out-the-window imagery video is digitized and compressed by the AP Labs HSDRS, then immediately made available in real-time for "live" network viewing using standard network multicast technology. Additionally, the video (and optional audio) streams are archived across the network and are then available for instant or delayed replay during post-mission debrief.



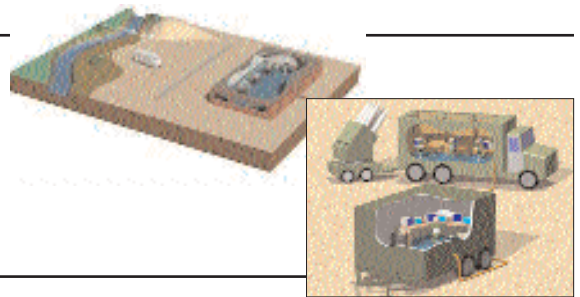


APPLICATIONS include Video Data Recording/Compression/Replay for:

- C4ISR (Command, Control, Communications, Computers, and Intelligence, Surveillance, Reconnaissance)
- Weapons Systems Trainers (WST) - Air Defense Ground Stations, Sonar, Radar Operators
- Flight Simulation Mission Brief/De-brief Systems
- Networked Video/Audio

RANGE TRAINING:

For the rugged environment encountered on military test ranges, the HSDRS can be packaged in a range of AP Labs enclosures - most often either in a compact flight-case, a rugged ATR-style enclosure, or "open-frame" for final integration by the customer into their specific environment. The system can be programmed to auto-record without any operator attention, and it is smart enough to know when it has suffered an unexpected "power-hit" - resumption of recording can then happen automatically, without losing previously recorded data.



FLIGHT SIMULATION:

For Flight Simulation applications the HSDRS is typically controlled by the customer's Mission Brief/Debrief System, via the fully supported network-based API. Real-time distribution and archival of multiple cockpit video displays, Out-The-Window imagery, and cockpit audio is supported with storage and simultaneous replay on (typically) Linux-based cost-effective COTS server/RAID systems.



WST AND C4ISR:

Weapons Systems Trainers and other simulated or deployed C4ISR applications benefit from the HSDRS' ability to record all of the high-resolution screen data and other data sources - all in real-time, all available for live network distribution and/or post-mission playback and review.



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