American Film Institute Silver Theater
Silver Spring, MD

Installation completion and troubleshooting of video production systems in this multi-use complex originally opened in 2003. Main production systems include 64x64 multi-format routing, SD and HD VTRs, digital production switcher and audio mixer, multiple cameras, intercom and audio record/editing room. Project has included completing interfaces with adjoining "black box" theater, conference rooms and film theaters utilizing film and digital cinema equipment, Crestron control and Media Matrix audio processors.

American Enterprise Institute
Washington, DC

2007: Installation of three-camera robotic system in large conference/presentation space, including AV switcher/mixer, and integration with existing house sound system.

2010: Upgrade of previous robotic system to HD and conversion of in-room displays from projection to LCD, including integration for local presenters. Design/install of small insert studio with separate control room and rear-projection video backdrop. Installation of three non-linear edit systems with SAN storage.

Project in 2010 comprised systems on three floors, with video and network interconnection. Included consultation with architect, GC and electricians, set and lighting designer, and various outside vendors.

Asparagus Media
Takoma Park, MD

2007: A/V wiring design and installation for two-room audio recording and post facility. Also consultation on architectural, acoustics and electrical, IT network setup.

Australian Broadcasting Corp.
Washington, DC

2004: Design and installation of Washington bureau for Australian Broadcasting. Systems included Avid and linear component edit rooms (BetaSP and SX), central machine room with 32x32 SDI/analog router, satellite downlink, CNN Pathfire, CBS Newspath and house CATV. Also audio booth and radio production studio.

2008: Addition of second Avid, other changes. 2009: Insert studio integration.

2014: Replacement of VTRs with video server, planning for HD upgrade.

Discovery Communications
(The Discovery Channel, Learning Channel, Animal Planet, and others...)
Bethesda, MD

1995: Design and installation of 14 Avid offline suites with interchangeable VTR racks and local signal routing in each room. Design and installation of central machine room serving 3 Avid systems with multiple VTRs, routing, monitoring and computer hardware management. Design and installation of enhanced Avid offline suite with extensive audio and patching facilities.

1996: Discovery International Networks: Design and installation of machine room and edit bays for 8 Avid systems with 24 mixed VTRs, routing, monitoring and computer hardware management. NTSC and PAL operation.

1997: Discovery Images Global Library: Design and installation of video/audio/control for Cinebase digital archiving system comprising multiple digital and analog Betacams (NTSC & PAL), Alchemist standards converter, 32x32 multi-level router and associated SGI workstations.

1998 - 2003: Consulting, design and installation for extensive multi-format, dual-standard integrated facility for all Discovery technical operations in Bethesda, MD, comprising 35 Avid edit rooms, 3 linear online suites, 2 graphics suites and over 100 VTRs. All equipment and VTRs housed in a comprehensive Equipment Center containing 83 racks. Design activities ranged from spec floor plans and architectural recommendations to complete audio/video system design and supervision of all technical installation.

Following initial installation: Avid upgrades to XL or Symphony, utilizing SDI video and digital audio (AES and embedded). Addition of Avid DS High-Definition system (including 5.1 surround monitoring and Dolby-E). Addition of Quantel Editbox suite. Addition of two Audio Post rooms built around Pro Tools w/internal video, Pro Control, DAT, DA-88, DBeta, 5.1 surround, Dolby-E. Installation of numerous additional processing and routing systems, upgrade of plant sync infrastructure, expansion of HD video capabilities. Facility decommissioned in 2003 due to company relocation.

Defense Logistics Agency
Ft. Belvoir, VA

2004: Rebuild of 1995-era control room serving multi-camera auditorium for live satellite presentations, plus in-house media production. System included For-A digital switcher, digital robotic cameras, Pinnacle Deko CG, Digital Betacam and DVCPro VTRs, Avid non-linear editors and existing analog router. Also included were ties to building CATV, auditorium booth and distance learning department, and addition of live captioning capability.

2010: Relocation and upgrade of 2004 systems. LTS laid out floor plans and specified electrical, HVAC, acoustical and lighting requirements. LTS designed and built three new edit rooms, central machine room, and master control featuring a multiview monitor wall and new operator console. A/V systems were upgraded for HD/SD routing and monitoring. KVM matrix and local IT network installed for increased flexibility. Avid systems include three Media Composers, Unity and Interplay.

2012: Upgrade to HD w/new cameras, Ross switcher and CG, etc.

2013: Addition of LTO archive storage for Avid.

Fast Cuts
Washington, DC

1995/96: Design and installation of new post-production complex comprising one serial component digital edit suite (Digital Betacam/Grass Valley/Zaxcom), redesign of two existing analog component suites, redesign of 2D and 3D graphics suites and central machine room. Systems included several small routers and extensive patching for analog & serial digital video and analog & AES digital audio.

LTS handled all video, audio and control design, technical (symmetrical) power system design, edit suite and console layout, and advised architect on building construction issues including acoustics, materials, HVAC, power and floor plans.

Federal Aviation Administration
Washington, DC

LTS has provided engineering services to the FAA Headquarters media department since 1994. This has included two major rebuilds of the infrastructure serving a multi-camera studio and separate auditorium (plus remote building locations).

The 2003 installation included 32x32 SDI and analog routing, and Ross Synergy digital production switcher. This system utilized Betacam and Digital-S VTRs, studio and robotic cameras/CCUs, intercom/IFB and extensive external feeds for satellite and telephone signals. Also included two Avid workstations and Unity on adjacent floor.

2011: Upgrade and rebuild of live production facility (incorporating 2003-2010 changes). Existing space was split into a central machine room and control room. New control room includes a custom operator console and multi-view monitor wall. System is now fully HD in both local studio and auditorium, with robotic and operator cameras, Ross Vision HD switcher, up/down conversion, wireless mics and intercoms, RTS Adam intercom matrix, HD monitoring, KVM matrix and local IT network. Also interfaced with existing Avids and newly renovated auditorium.

Georgetown Post
Washington, DC

LTS has provided engineering services to this post facility since before 2003. Initial 2003 install comprised seven edit rooms (originally populated with Avid Symphony/Adrenaline and HD-capable Avid|DS Nitris), two audio suites, central machine room, voice booth, graphics systems.

Ongoing changes included move to Final Cut Pro and to tenant/rental rooms. In 2011 facility size was reduced while audio rooms were upgraded to include a large acoustically improved voice booth and improved surround mixing capability.

LTS also provides administration and wiring for the IT network, which includes network routing, FTP server, VPN access and other functions.

Georgetown University School of Continuing Studies
Washington, DC

2014: Supervision, design and installation for multi-purpose HD broadcast studio featuring Panasonic robotic cameras, Ross switcher, AQ Broadcast video server, Utah Scientific SDI router, Soundcraft digital mixer, Cobalt and Ensemble Designs terminal gear, computer/internet integration, teleprompter, KVM switching and local networking. Studio set includes seven background LCD displays driven by TVOne Coriomaster videowall processor, digital signage players, HDMI switching.

Consulted on studio space, electrical and HVAC with building architect and GC, coordinated set and lighting integration with outside designers.

Marriott Corp. **Headquarters** Bethesda, MD	2007: Rebuild of A/V systems for convertible auditorium/conference room and projection booth. Included specification and installation of projectors, digital routing, wireless and wired audio, Crestron control system, live camera and call-in equipment, monitoring. Also design/installation of dubbing and audio editing systems for Marriott Productions.
National Association **of Home Builders** Washington, DC	2002: Installation of multi-room editing facility for NAHB internal production and cable programming (HGTV). Systems comprised four non-linear edit suites (Avid and Final Cut), audio room, central machine room, digital and analog router and VTRs. 2010: Rebuild of existing 2002 facility to complete HD upgrade and remove analog components. All edit systems were Final Cut, workflow is primarily tapeless with some HDCam. Upgrade included HD routing and monitoring.
National Geographic **Society** Washington, DC	2006: Design and installation of HD "front-end" for the NGS Digital Media Group archiving system. Equipment includes HD VTRs in DVCPro, HDCam, D5 and HDV formats, 32x32 HD router, Teranex converter, Avid and Final Cut HD systems, patching and monitoring. Integrated with existing SD dub system.
The Network Group / **Wingspan Network** Bethesda, MD	1997/8: Design and installation of central machine room and suites for dual-standard digital online edit and Bosch/DaVinci telecine system. LTS handled all video/audio/control systems, technical (symmetrical) power and architectural/HVAC consulting. Facility also housed seven non-linear editing systems from EMC2, Avid and Media100. Move and integration of several audio post-production systems (Sadie and Waveframe) into acquired existing facility, including rewiring of patchbays, tie lines and machine room rebuild. Previous: Designed and installed component Betacam A/B Roll system incorporating Abekas A34 Solo, color correction, extensive patching and routing. Project encompassed video/audio/control, architectural/acoustic modifications, AC power, console design. Installed and maintained Marconi Digital Line Array Telecine and associated equipment for 16 and 35mm film transfer to component Betacam. Designed NTSC/PAL standards conversion system for installation at remote location.
ORF Austrian **Radio & Television** Washington, DC	2005: Rebuild of Washington bureau for Austrian Radio & TV (in conjunction with equipment vendor Washington Professional Systems). Systems included two Avid Newscutter edit rooms, BetaSP and SX VTRs, central machine room with Avid Unity Lanshare, 16x16 SDI/analog router, satellite downlink, Pathfire and CBS Newspath servers 2009: Change of 2005 systems to all Final Cut, added chromakey insert stage. 2013: Upgrade to HD, including new router and fiber interconnect.
Otthouse Audio Silver Spring, MD	2009: Design and installation of infrastructure for audio post facility comprising three Pro Tools mix suites with surround and LCD or projection video, central machine room, audio booth. LTS installed all audio/video/control systems, including analog and AES audio, extensive patching and extension for DVI and SDI video, and fiber optic transport of SDI/embedded audio to video post facility in adjacent building. LTS consulted on the acoustic design and supervised some construction processes. LTS also provided administration and wiring for the IT network, which includes network routing, FTP server, and other functions.
Roar Productions Columbia, MD	1980 - 1995: Designed and built two multi-track music studios for original Roar Productions, Columbia, MD. 16-track studio built around Neotek Series II console, MCI JH-24 16-track, Otari MX5050 8-track (including custom-built autolocator), dbx noise reduction, misc. outboard gear. 24-track studio built around Neotek Elan console, Ampex ATR-124, Otari MTR-10, misc. outboard gear. Studio design included architectural, acoustic, electrical/lighting and HVAC plans, in addition to studio wiring, custom interface panels and control room furnishings. Supervised re-installation of smaller audio facility at Spicer Productions, Baltimore, MD (1995) and move back to Columbia (2002).

The Smithsonian Institution Washington, DC	National Museum of American History: Designed and installed video and audio viewing/dub racks for NMAH Archive Center.
	National Museum of Natural History: Designed and installed video and audio viewing/dub racks for NMNH Human Studies Film Archives.
	Museum of American Art: Designed and installed video and audio viewing/dub racks for Archives of American Art.
	National Museum of the American Indian: Designed and installed video and audio viewing/dub racks and researcher viewing stations for NMAI Archive Center.
	Smithsonian Institution Archives: Video/audio viewing/dub system for Archive Center.
	National Air & Space Museum Udvar-Hazy Center: Video/audio viewing/dub system.
	All systems include some analog/digital VTRs, routing and monitoring for legacy formats.

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TV One Network Silver Spring, MD	2006: Design and installation of edit/dub/QC system for in-house operations. Included two Avids, DBeta, IMX and XDCam VTRs, 16x16 SDI router, patching and monitoring. Also includes KVM switching for access to several computers and QC servers.
	2008/Ongoing: Expansion of routing switcher and addition of HD VTRs, monitors and Avids. Facility now comprises eight Avid edits with Unity, Isis, HD and SD VTRs, HD/SD routing and monitoring, etc.

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U.S. Census Bureau Suitland, MD	LTS has provided engineering services to the Census Bureau media department since 1996. In 2007 a new building was constructed requiring a complete rebuild/relocation of the post-production facility, including three Avid non-linear systems with Unity, routing and monitoring for numerous VTRs, central machine room, and radio production studio.
	2011: Extensive facility upgrade, including Avids and Isis/Interplay, and new HD studios with production sets and lighting grid, Broadcast Pix integrated switcher, multiview monitor wall, etc.

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U.S. Secret Service Washington, DC	2004: Rebuild of large multi-format dub system with 32x32 router, connection to edit rooms and studio control, router interface integration.
	2006: Rebuild of Video Forensics Lab, incorporating large video/audio router, many small-format VCRs, computer workstations and monitoring facilities for examination of crime-scene recordings.
	2014: Upgrade of former dub system to digital/HD, with SDI routing, HDMI conversion, etc.

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ZGS Communications (Telemundo) Shirlington, VA	2010: Upgrade of master control and news studio control rooms for regional cable channel Telemundo TV64. Air chain and studio infrastructure is all HD, utilizing Ross, Miranda and Cobalt terminal gear, 360 Systems servers, multi-view monitor walls and fiber optic links to transmitter and cable head-ends.
	Original 2002 facility was composite analog, including Betacam and DVCPro VTRs, DDR (spot playback), routing switcher, master control switcher, Video Toaster II, analog audio.
	Also design work for ZGS–owned stations WTMU (Boston), WRIW (Providence),WRDM (Hartford), WTMO (Orlando), WWDT (Naples), WRMD (Tampa).

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Representative Additional Clients	International Monetary Fund, Washington DC	Magnet Interactive Studios, Washington, DC
	National Science Foundation, Arlington, VA	Horizon Entertainment, Rockville, MD

Integration of non-linear editing systems (Avid, Final Cut, etc.) with VTRs, audio equipment and monitoring via patchbays, routing switchers or hard-wired, since 1993 include:

Amtrak, Wash DC / Wilmington, DE; CNN (Larry King Live), Wash DC; Richfield Productions, Wash DC; Cactus Productions, Cheverly, MD; Glen Pearcy Productions, Wash DC; MQN Productions, Bethesda, MD; Silver Ridge Productions, Vienna, VA; Struble Oppel Donovan, Wash DC; Ehrens Motion & Music, Bethesda, MD; Engine Pictures, Wash DC; O'Keefe Communications, Wash DC; Ogilvy Public Relations, Wash DC; The Johnson Group, McLean, VA; RedEye Post, Alexandria, VA; Williams Gerard, Arlington, VA; Sutherland Media, Wash, DC; Knight Ridder Tribune, Wash, DC; Icon Communications, Alexandria, VA; Caragol Wells Productions …