

Technology Development Services

Successful Client Projects Illustrating Capabilities and Experience:

Digital Audio Router High-speed FPGA design using Xilinx Virtex-II Pro FPGAs, time-division-multiplexed (TDM) communication and 3 gigabit serial I/O. Verilog and ModelSim were used for design implementation and test-bench development.

Fingerprint Sensor FPGA interface to a biometrics fingerprint sensor consisting of a host system interface and sensor control state machines. Incorporates a 1.5cm x 1.5cm solid-state fingerprint sensor from Fujitsu with a 300 x 300 pixel array capable of producing clear 500-dpi resolution images.

1553 Communication Controller FPGA design supporting a MIL-STD-1553 communication protocol controller. The 1553 interface is specifically designed to work with transformer-coupled stubs in military Local Area Network (LAN) applications, including airplanes and helicopters, as well as space and land-based systems.

Media Pool Video Server A multi-channel video server that is used worldwide within the broadcast television industry. Integrated processor & communication controller along with Xilinx and Altera FPGAs were used to control the storage of high definition digital media onto a proprietary high performance disk array. Developed VxWorks and UNIX based real-time software including interrupt driven performance critical C++ and assembly language.

Media Pool won a 2001 Emmy award for the "pioneering developments in shared video-data storage systems technology for use in television video servers".

Archive Solution for Digital Media Video, audio and time-code are written to Fibre and SCSI tape drives for near-line storage of material. Enhanced high speed SCSI / Fibre interface between a video server and an automated storage library and expanded functionality to include support for numerous devices.

Digital Media Transfer High speed (270 Mbit) transfer of compressed digital video and audio between video servers. Incorporated transfer management software to "auto shadow" data files from a master system to a slave.

Digital Video/Audio Switch Signal router for professional quality video and AES audio used in the broadcast television industry. Developed an Altera based FPGA design with JTAG interface.

Windows NT Device Driver A hardware direct driver to control eight PC Card (PCMCIA) modems over a VME bus. Developed software for the port configuration, serial protocol and the management of multiple VME interrupts.

PCMCIA Interface Controller Created custom Xilinx based PC Card (PCMCIA) controller used in a portable CD-ROM product. Developed HDL and schematic based hardware and C++ software.

GlidePoint TrackPad A touch sensitive pointing device that detects and tracks fingertip movement through a custom mixed-signal ASIC. Developed prototypes through the extensive use of FPGA designs. Completed a mixed-signal ASIC used in production. GlidePoint was voted to be one of the "Best Products of 1994" by PC Magazine.

GlidePoint was licensed to Alps Electric and has subsequently been built into numerous brands of notebook and laptop computers as well as desktop keyboards and pointing devices.

ASIC Based Microcontroller Subsequent versions of GlidePoint have included a custom ASIC based microcontroller with custom assembler. Using this microcontroller the system has been integrated into a single chip solution. Development included multiple ASIC iterations along with associated simulations, PC based utilities for debug and test and a functional test with an artificial finger.

RAID Disk Array An array of disk drives with lossless compression used to store high rate video images. A series of up to eight drives were used to store real-time video images at resolutions of up to 1024 by 1024 pixels and at rates up to 60 frames per second.

Hardware design used 12 Altera FPGA circuits.

Medical Imaging System Real time imaging and storage of medical X-ray data at either 30 frames per second or 4 frames per second. Hardware interface included an Actel FPGA.

Portable Hard Drive Parallel printer port interfaced hard drive system providing portable storage for notebook computer systems. Included DOS/Windows device driver, format/partition/setup utility and a Xilinx based hardware design.

Security Architecture High technology product security utilizing data encryption, hardware security keys and software system verification. The hardware design included two large Altera FPGA chips.

Plasma Display Controller High-resolution graphics controller for the Fujitsu 12000S/20000S plasma panels. The controller is based on the Texas Instruments TMS34010 graphics processor, dual ported video RAM, dynamic RAM, KANJI font ROMs and a software configurable 16-bit PC/AT bus interface.

BIOS Interrupt 10h Emulation ROM based software that provides complete emulation of the BIOS interrupt 10h functions on a TMS34010 processor. Features include multiple fonts, PC system boot time initialization and IBM BIOS compatibility.

NetWare for the Macintosh Network gateway system that seamlessly integrates Macintosh computers into Novell NetWare LANs. As one of the principle architects for this project, a server based Value Added Process (VAP) was implemented within the NetWare environment to provide the features required by the Apple Macintosh.

High Resolution Graphics Accelerator High-resolution full color CRT controller based on TMS34010 graphics processor, Xilinx FPGA control and video interface circuitry and display driver software.

DaynaFile Compatibility disk drive permitting Macintosh computers to transparently read and write MS-DOS format diskettes. Includes "Finder-level" Mac interface software and custom microprocessor based SCSI disk controller.

DaynaTalk AppleTalk speed-up product that is used to increase the performance of an AppleTalk network. One of two principle software engineers on this project.

MacCharlie The original PC/MS-DOS coprocessor system for the Apple Macintosh providing complete IBM PC compatibility.

Apple Portable Macintosh Internal Modem Design and development of hardware and firmware system for an internal modem. Power down features and full Hayes compatibility were provided.

IBM 591 Plasma Display Controller A display system that drives an IBM high-resolution flat panel plasma screen. Including microprocessor control and real time graphics software.

Utah Arm A battery powered prosthetic arm including 146805 microprocessor digital joint control.

Ball-Trek Microprocessor controlled ball trajectory projector for Golf Simulation Machine.

Partial Client List:

Thomson Multimedia
Phillips Digital Video Systems
Cirque Corporation
3-Com / US Robotics
World Wireless Communications
American Microsystems Inc. (AMI)
Phillips Broadcast Solutions

Fujitsu Microelectronics
Evans & Sutherland
Dayna Communications (Intel)
OEC Medical Systems (GE Medical Systems)
Broadcast Television Systems (BTS)
The Parvus Corporation
Axonix Corporation