Purpose

- Develop the controller subsystem of an Ethernet based video communication system
Requirements

- Cost Effective Solution
- Portability
- Software Robustness
- Large Support Base
- Low Power Consumption
Possible Solutions

• ARM 922T Pros
  • Memory Manage Unit for use with multitasking Operating System
  • High Clock Speeds
  • TCP Stack support
  • GNU compiler support
Possible Solutions

- **ARM 922T Cons**
  - Requires special bussing to interface to other devices
  - Requires custom driver development
  - Softcore for ASIC development
Possible Solutions

• AMD ELANSC520 Pros
  • 5x86 Architecture
  • PCI bus
  • General Purpose I/O
  • Power Conscious Design
  • High Clock Speed
  • Large Software Support
  • Built using commodity-based components
  • Low Volume Pricing
Possible Solutions

- **AMD ELANSC520 Cons**
  - 600mA Power Draw
  - Lower Clock Speed than ARM9
  - CISC Architecture
Operating Systems

- Windows CE
- Linux
- FreeBSD
- OpenSBD
- NetBSD
Windows CE

- Large development drive from large corporation
- Product support
- Popular easy to use interface
- Requires expensive porting license
- Difficult to customize
Linux

- Large online community for support

- Software Packages can take a lot of work to configure
FreeBSD

- Custom support for the ELAN processor
- Capable of Running all Linux binaries
- Ports Tree guarantees software packages to work correctly
- Designed to be fastest OS on x86 Architecture
- Good online documentation and support community
OpenBSD

• Proactively Secure
• Wide range of network options
• Ports Tree is lacking compared to FreeBSD
• Slower on x86
NetBSD

- Wide range of multiplatform support
- Nothing custom to the ELANSC520 processor
Proposed Configuration

• ELAN processor
• PCI bus
• 10/100 Ethernet
• ATA compact Flash storage
• SDRAM main memory
• Serial Communications
• FreeBSD
Software Support

- TCP Stack
- RTOS
- MPEG codec
- Device Drivers
- I/O Expansion
Power Consumption

- 600 mA: Processor
- 300 mA: Board
- 100 mA: Display

Total Consumption
1 A @ 5VDC
Market Analysis

Projected Sales:
10,000 Units
Market Analysis

Total Material Cost per Unit: $200
Unit Cost Breakdown

- $25: Processor
- $5: Ethernet Chipset
- $20: PCB
- $30: Input / Output
- $30: Memory / Storage
- $40: Audio / Video Unit
- $50: Display

- $200: Total Unit Cost
Development Costs

Total Development Cost for the Project: $35,850
Development Costs

- 3 Engineers
- Estimated 1 Month for a Protoboard Design
- $400 per PCB board
- Projected 3 iterations of PCB
Development Costs

- 3 Engineers, each at $3850/month for 3 months

- Total Wages: $34,650
- 3 Protoboards: $1200

Total Development Cost: $35,850
Initial Investment

- Total Materials for 10,000 Units: $2,000,000
- Total Development Costs: $35,850
- Initial Investment: $2,035,000
Profits

• Initial Investor: 10%
• Company: 5%
• Total Gain: 15%
• Total Income: $2,314,227
Market Price

- **Income:** $2,341,227
- **Units:** 10,000
- **Market Price:** $235 / Unit
Results

We Profit $305,377 For 3 Month Labor