# Homework 3: Final Design Project Proposal Due: Thursday, February 5, at Class time

Feam Code Name:Magical Gnomes of Death		Group No12
Team Members (#1 is Team Lead	ler):	
#1: _Jeff Turkstra	Signature:	Date: _2/04/2004_
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## Abstract:

This device will essentially be a "black box" capable of turning any standard VGA display into a "digital picture frame." The box itself will be composed of a VGA connector, push buttons, status lights, an Ethernet connector, as well as a remote control. The push buttons will be used for navigation between individual pictures, which will be received via an Ethernet connection. The Ethernet connection may eventually be connected to a wireless bridge in order to utilize 802.11b/g.

## **Design Objectives:**

- Interface a VGA graphics controller chip to a microcontroller
- Interface a VGA graphics controller chip with a standard VGA display device
- Interface a microcontroller with Ethernet
- Interface a microcontroller with an IR remote
- Run the entire system using an inexpensive, commercially available power supply
- Design a user-friendly, aesthetically pleasing, thin, light-weight, ergonomic case
- Write a user-friendly program to run on a PC to manage transmitting data via Ethernet to the device as well as ensuring proper image size and color depth

#### **Design/Functionality Overview:**

The "digital picture box" will display digital photographs utilizing the JPEG format. It will use a Rabbit microcontroller with Ethernet to load images from a network server. The picture can be displayed on any standard VGA compliant device (i.e., an LCD or CRT monitor). The display will contain at least two pushbuttons enabling the user to cycle through the available images. IR transmit/receive capability will also exist, permitting the device and display to be placed in a location that is difficult to access directly. The entire system will be powered by a 9 VDC power supply. There will be an onboard JPEG decoder chip to reduce the bandwidth needed to transfer the pictures via TCP/IP. Finally, there will be a small GUI on the PC allowing the user to select images as well as ensure that each image is properly scaled with the correct color depth. The Rabbit microcontroller will interface with this "control GUI" via Ethernet.

# **Project-Specific Success Criteria (list 5):**

- 1. Ability to interface with a VGA controller
- 2. Ability to receive decoded JPEG image data via Ethernet
- 3. Ability to receive and interpret IR command signals from a remote
- 4. Ability to generate text-overlay on VGA device
- 5. Ability to receive and decode signals from on-device pushbuttons as well as drive LED's (power and data)

## **Block Diagram:**

See attached.

## **Division of Labor:**

Design Component Homework		Professional Component Homework		
Packaging Design and Specs	Ego	Design Constraint Analysis/Parts List	Phil	
Circuit Schematic and Narrative	Bill	Patent Liability Analysis	Bill	
Board Layout	Jeff	Reliability and Safety Analysis	Ego	
Software and Narrative	Phil	Social/Political/Environmental Analysis	Jeff	