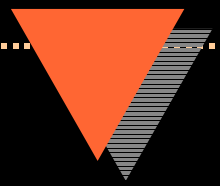


MPEG 1 Layer III Codec

Project Proposal & Progress Report

8 DEC 98

Brad Erwin & Mary Lou Kesse

Order of Events...

- Project Introduction
- Background Information
- Block Diagram
- Lab Work to Date
- Future Plans
- Schedule

Project Introduction

- MPEG-1 Layer III (MP3) audio decoder with a TI C6x DSP.

Deliverables

- Simulation of simple compression with MATLAB.
- Development and simulation of C code to decode standard MPEG-1 Layer III data frames.
- Implementation of decoder on a C6x eval board.

Background Info

- History Lesson
- Patents
- ISO/IEC #11172
  - 44.1 KHz sampling
  - 16-bit stereo, CD-quality sound
  - 12:1 compression ratio
- References

Encoder Block Diagram

Decoder Block Diagram

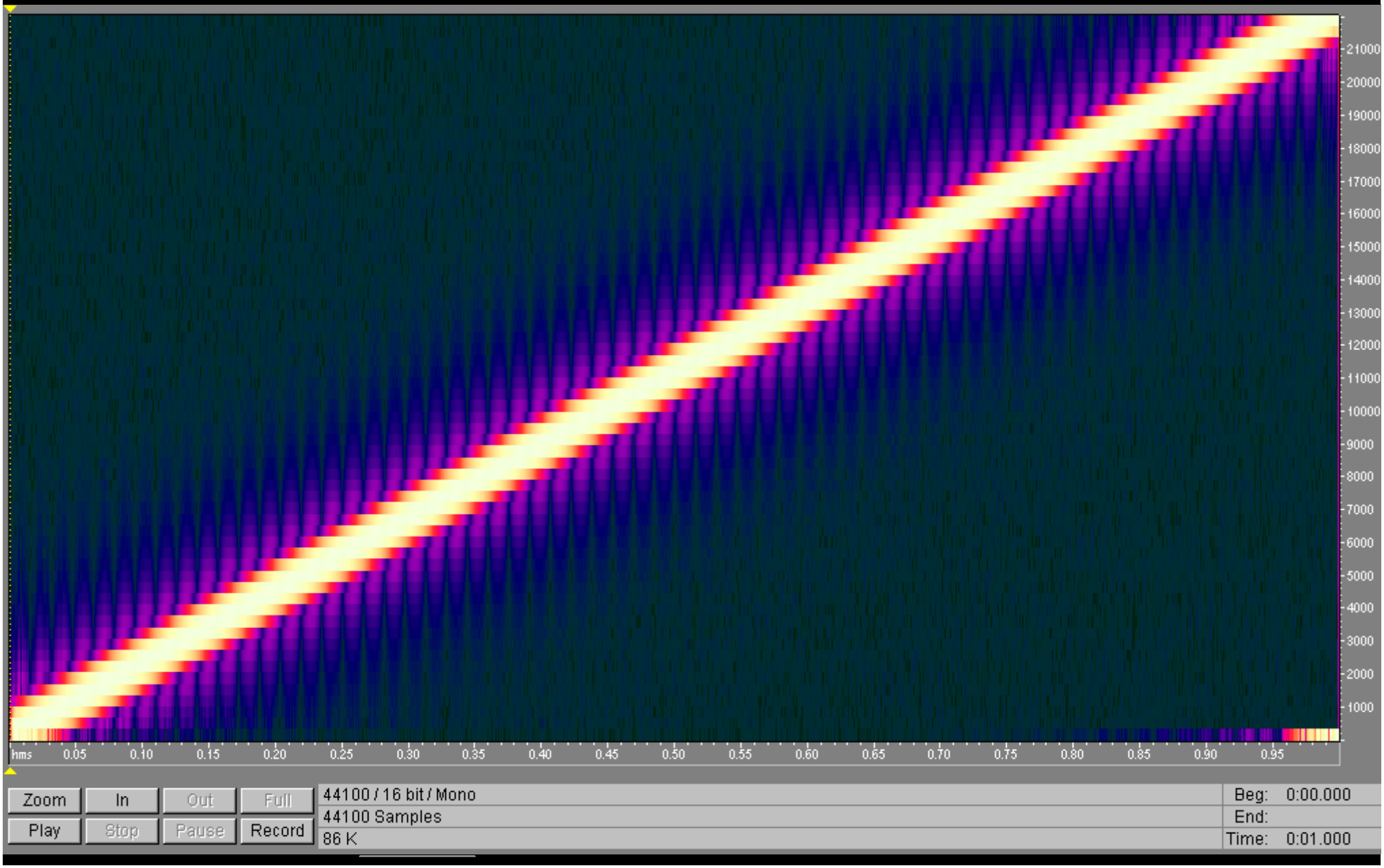
Lab Work Checklist

- MATLAB Simulation
- Interim Research
- C6x Simulation
- Hardware Test

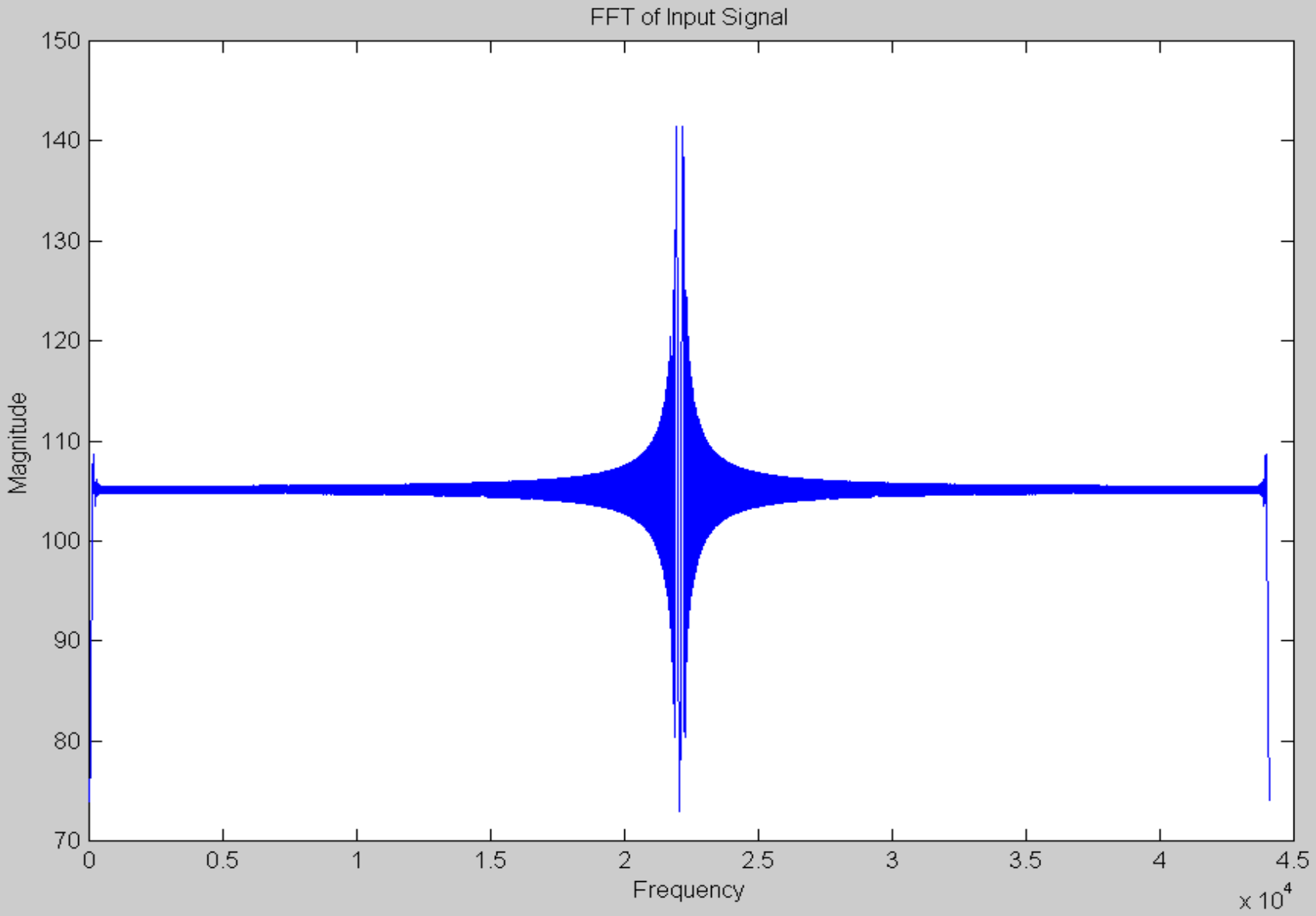
MATLAB Simulation

- Intro to DSP and Signal Processing Toolbox
- Simulated parts of block diagram
  - Bandpass Filter Bank
  - Downsampling & Upsampling
  - Recombination & End Filtering
- Expected input signal as output

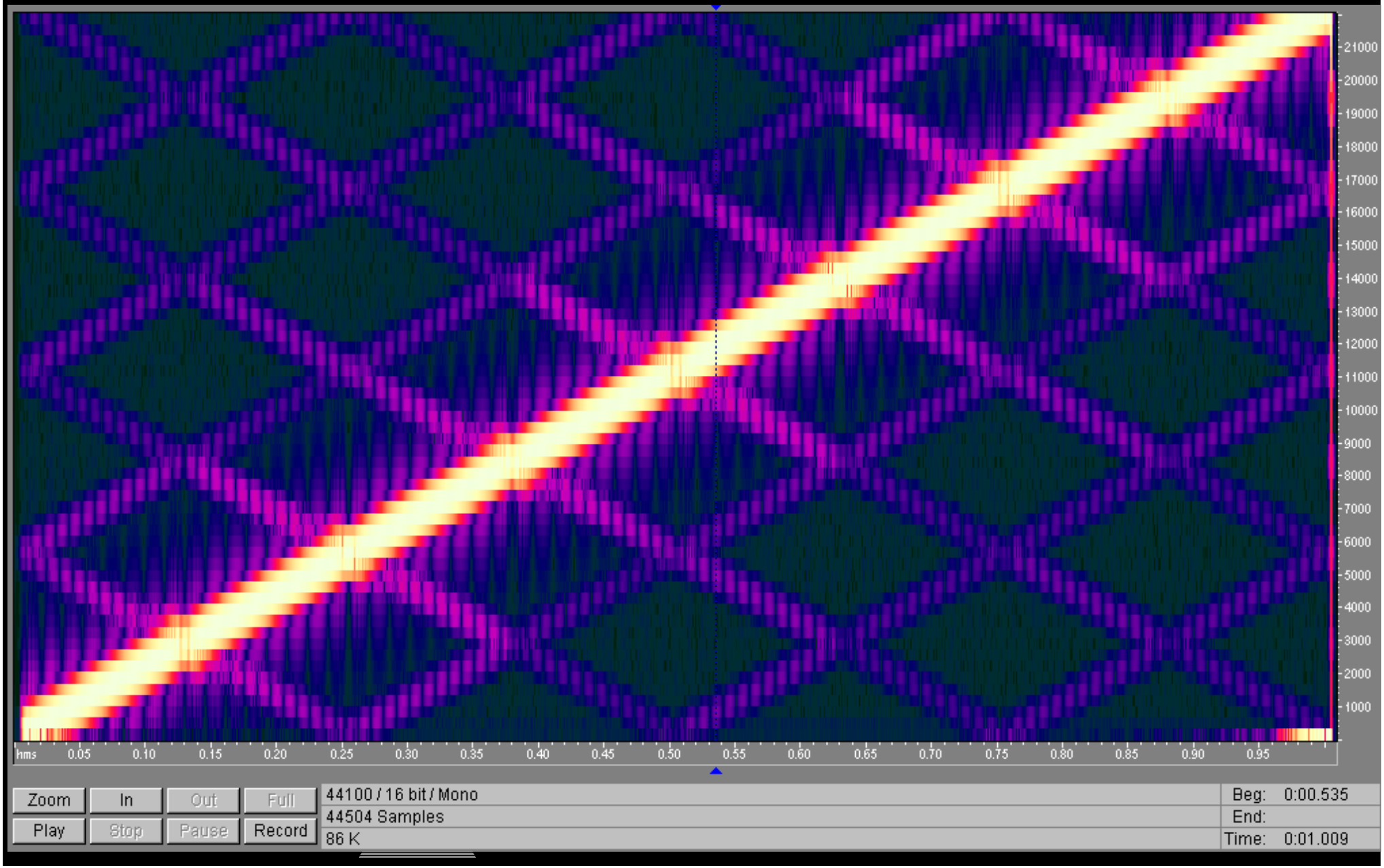
Input Ramp Signal - WAV file



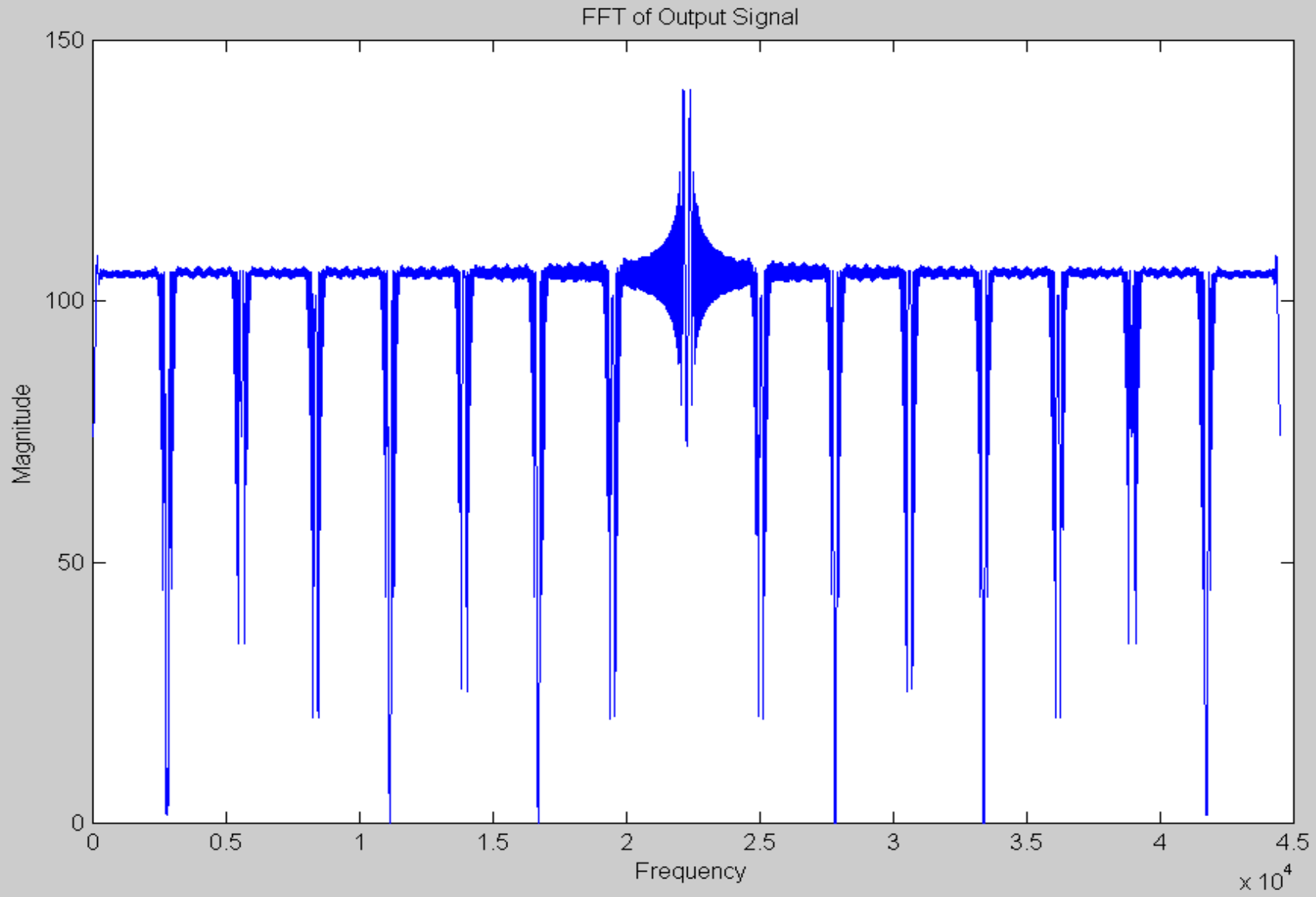
FFT of Input Ramp Signal



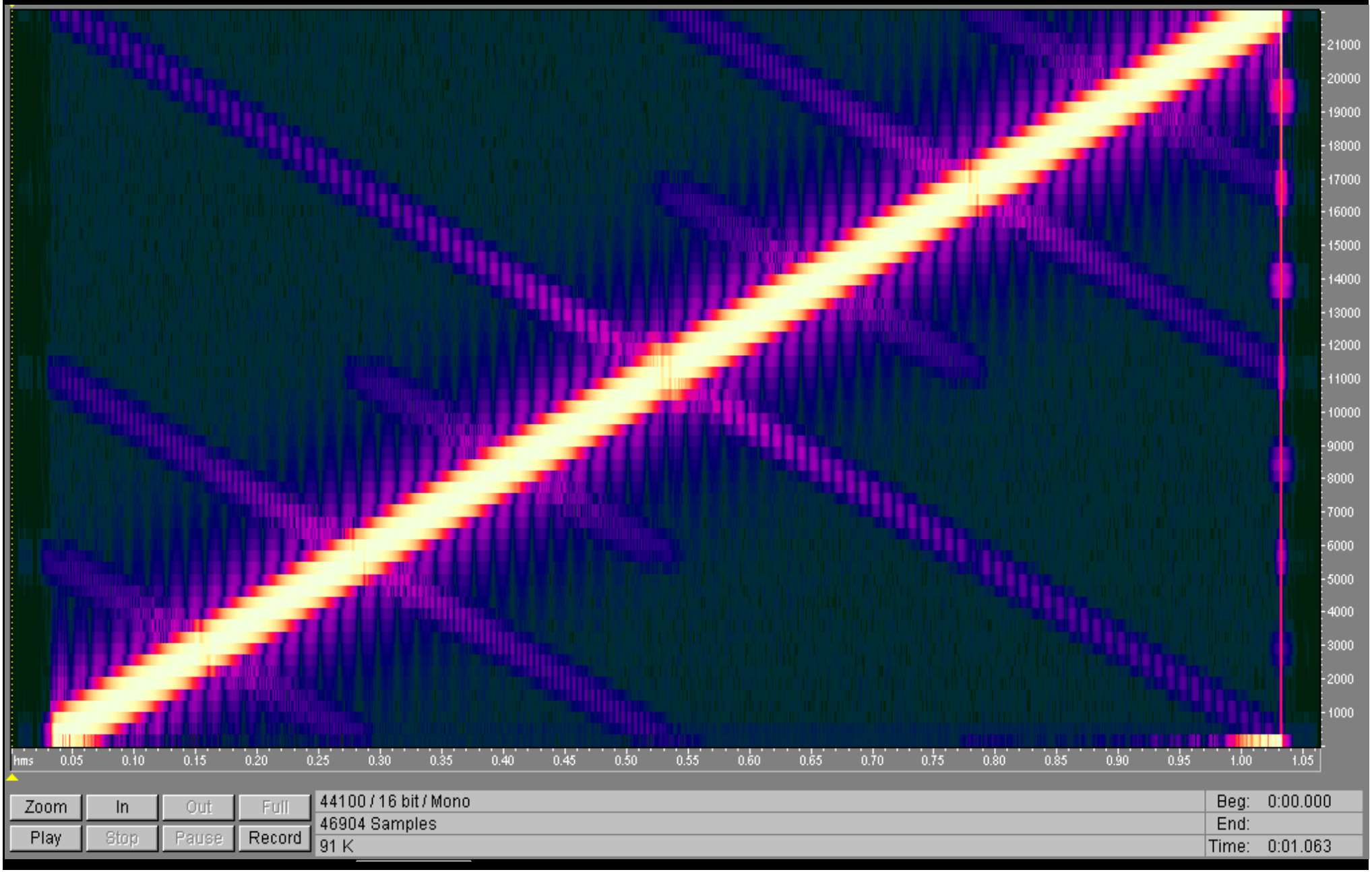
Output Signal using Parallel Filters



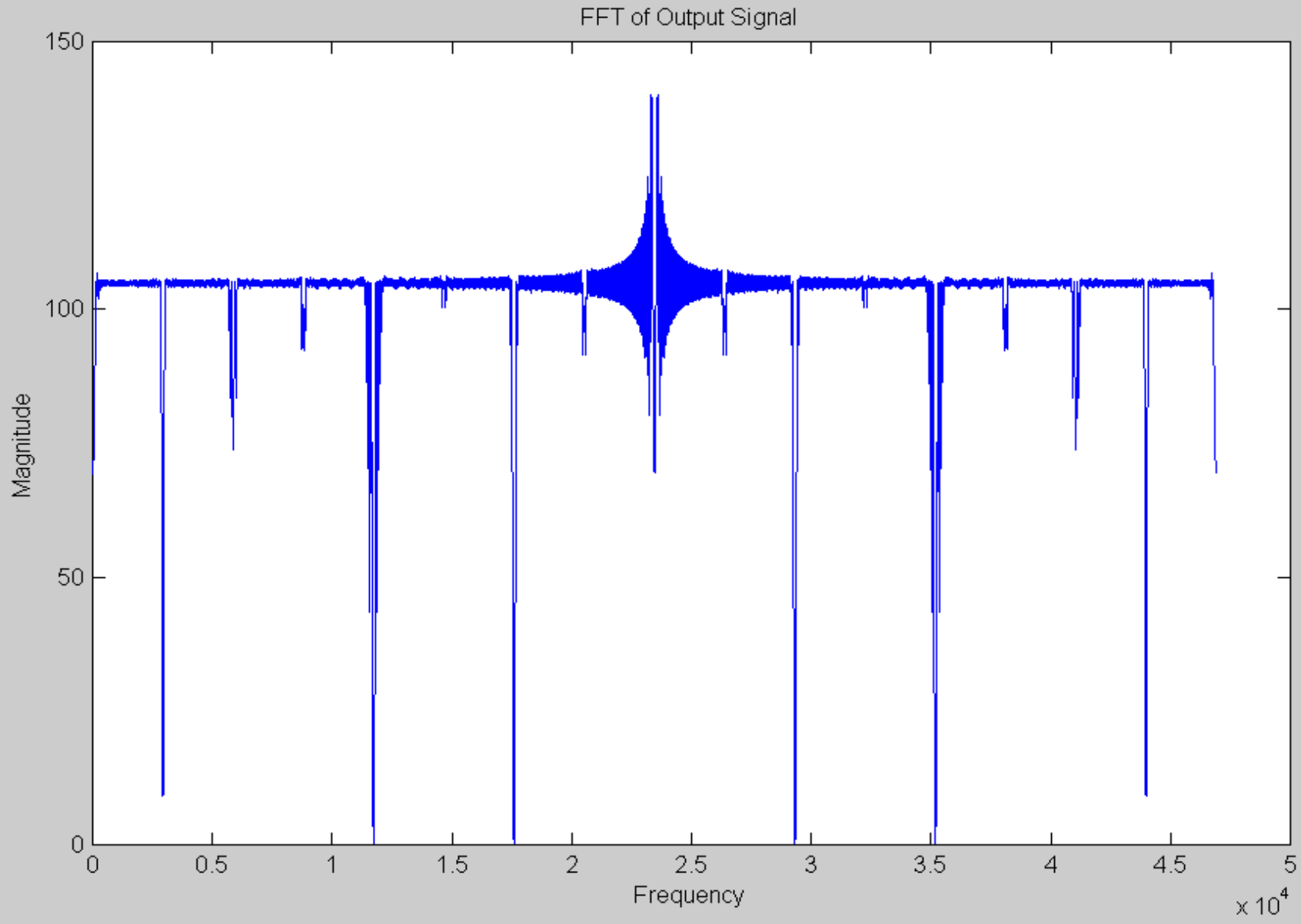
FFT of Output Signal - Parallel Filters



Output Signal using Cascaded Filters



FFT of Output Signal - Cascaded Filters



Research Topics

- Data Frames
- Huffman Coding
- IMDCT
- Reconstruction Filter Bank

Data Frame Format

C6x Simulation

- Write C code for decoder portion of block diagram
- Input: MP3 files stored on host CPU hard drive
- Expected Output: PCM coded WAV file

C6x Hardware Test

- Use C code from simulation
- Input: Pre-encoded MP3 frames stored in eval board memory
- Expected Output: Extrapolated audio signal

Lab Work Checklist

- ☑ MATLAB Simulation
- ☐ Interim Research
- ☐ C6x Simulation
- ☐ Hardware Test

Schedule