

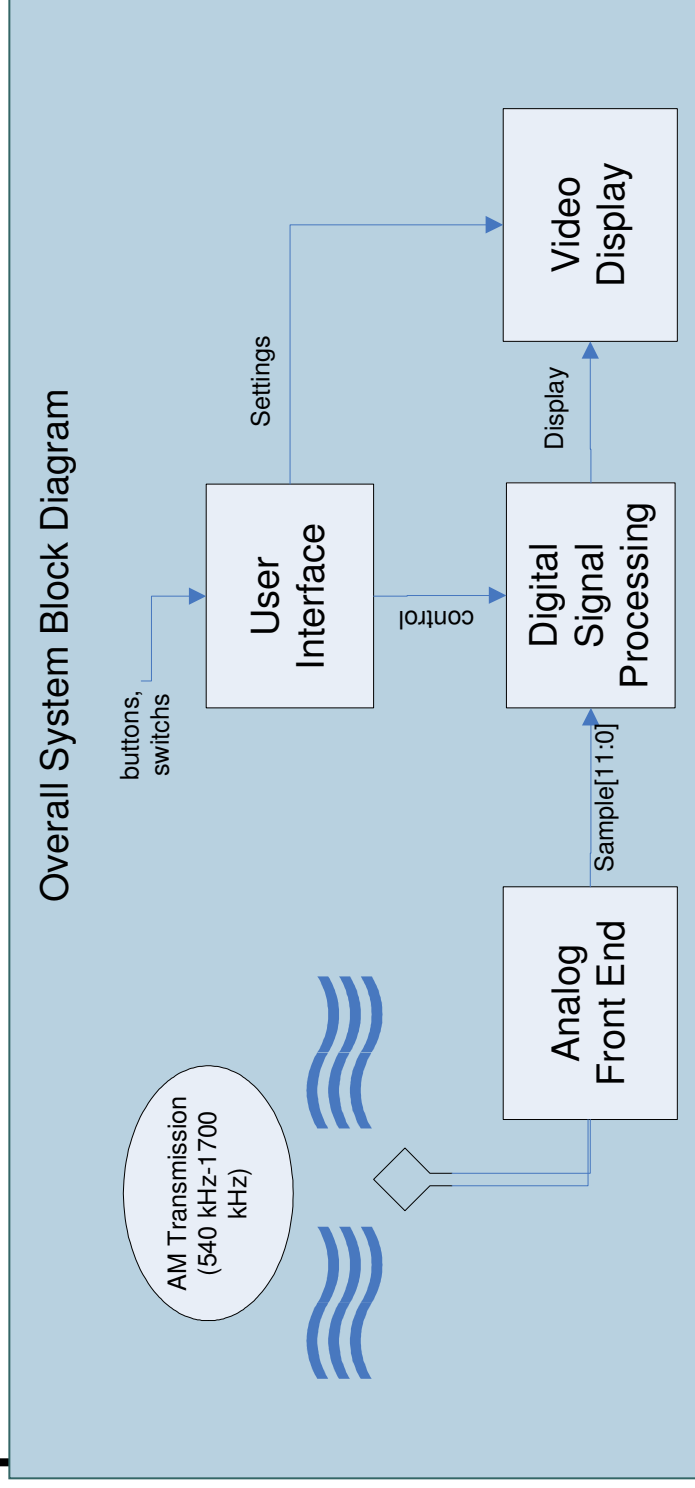
Digital AM Receiver System

Hassen Abdu, Ebad Ahmed, Wajahat Khan

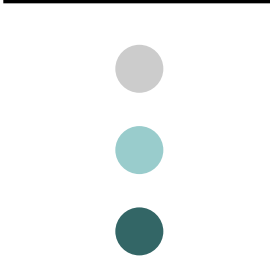
April 21, 2005

6.111 Introductory Digital Systems Laboratory

Overall System



- Hassen: Analog Front End & Video Display
- Ebad: User Interface
- Wajahat: Digital Signal Processing

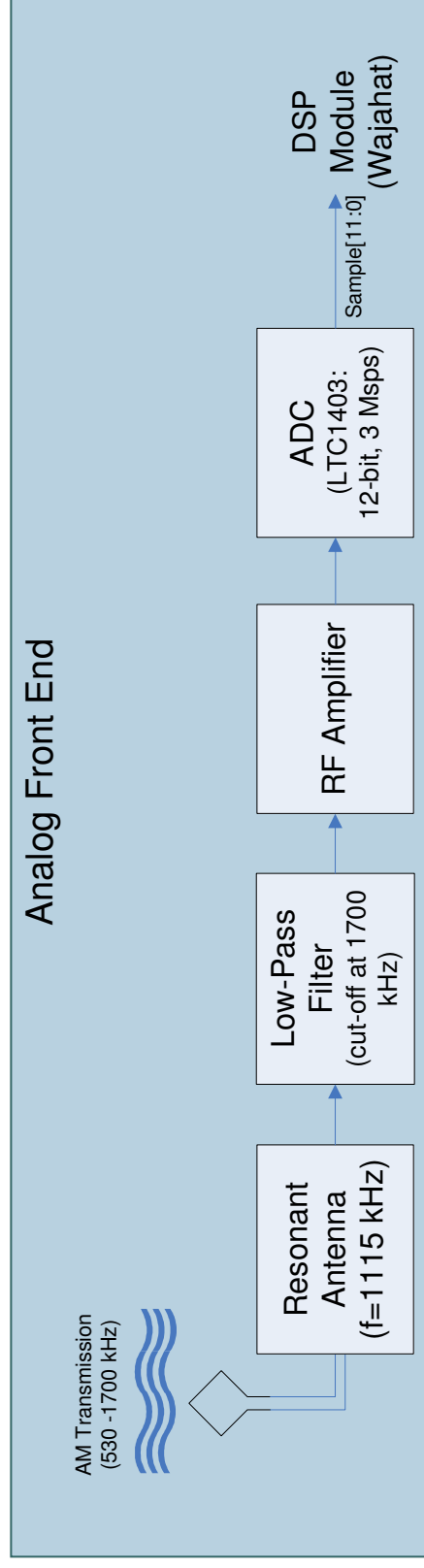


Digital AM Receiver System

- **Our system receives the entire AM frequency band (530kHz-1700kHz)**
- **Signal Processing done in the digital domain to demodulate AM signals**
- **User-programmable and customizable**



Implementation of Analog Front End



The Analog Front End will:

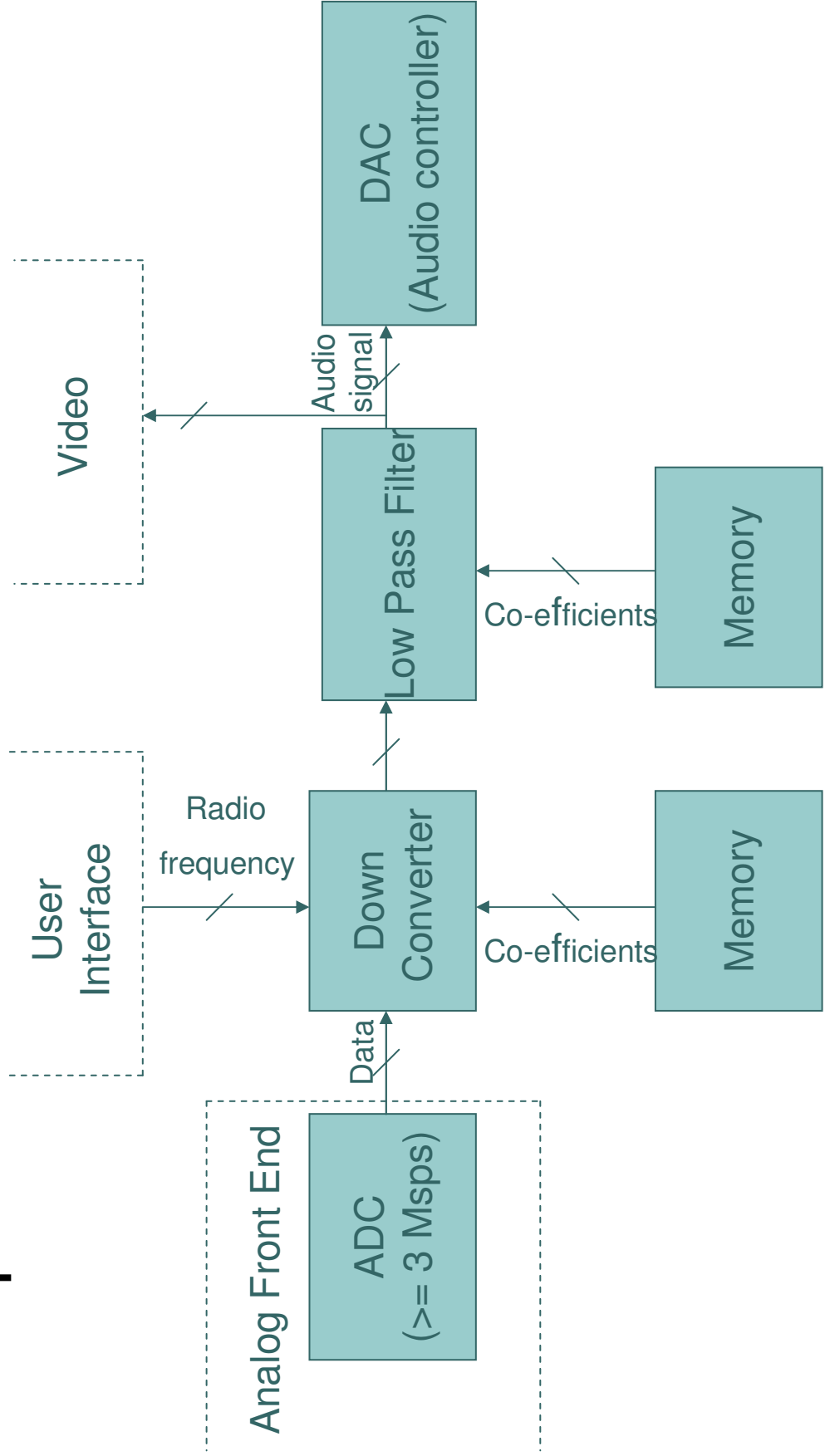
- 1. Receive the AM frequency band by resonating at the center frequency of the AM band and filtering any frequencies above 1700kHz**
- 2. Amplify the received AM transmission**
- 3. Digitize the analog signal to be used by the DSP module**
 - 12 bit samples at 3 Msps (caution: Nyquist rate)**



Digital Signal Processing

- Sampling
- Down-conversion
- Low-pass filtering
- Decimation

DSP Block Diagram



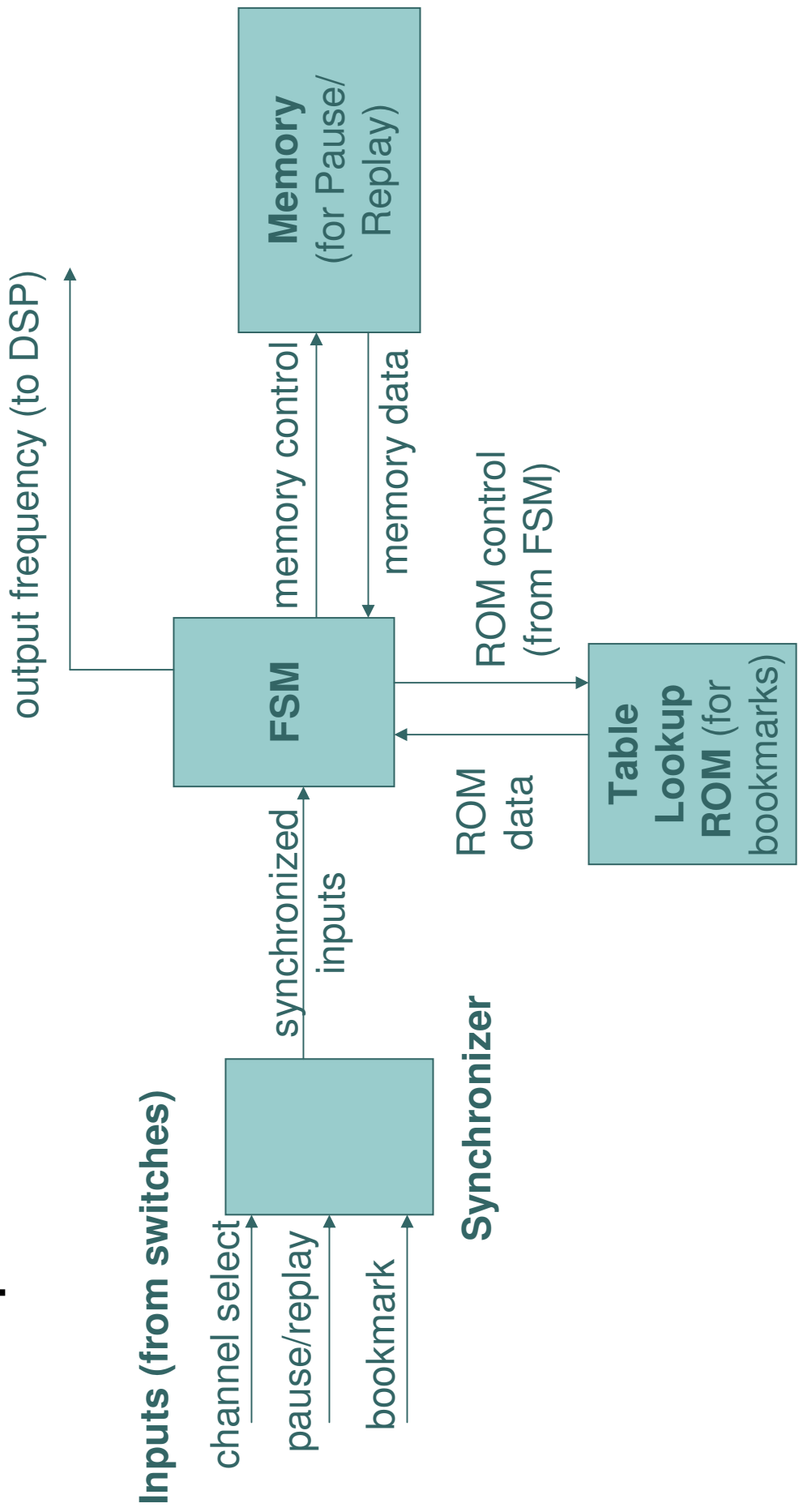


The User Interface

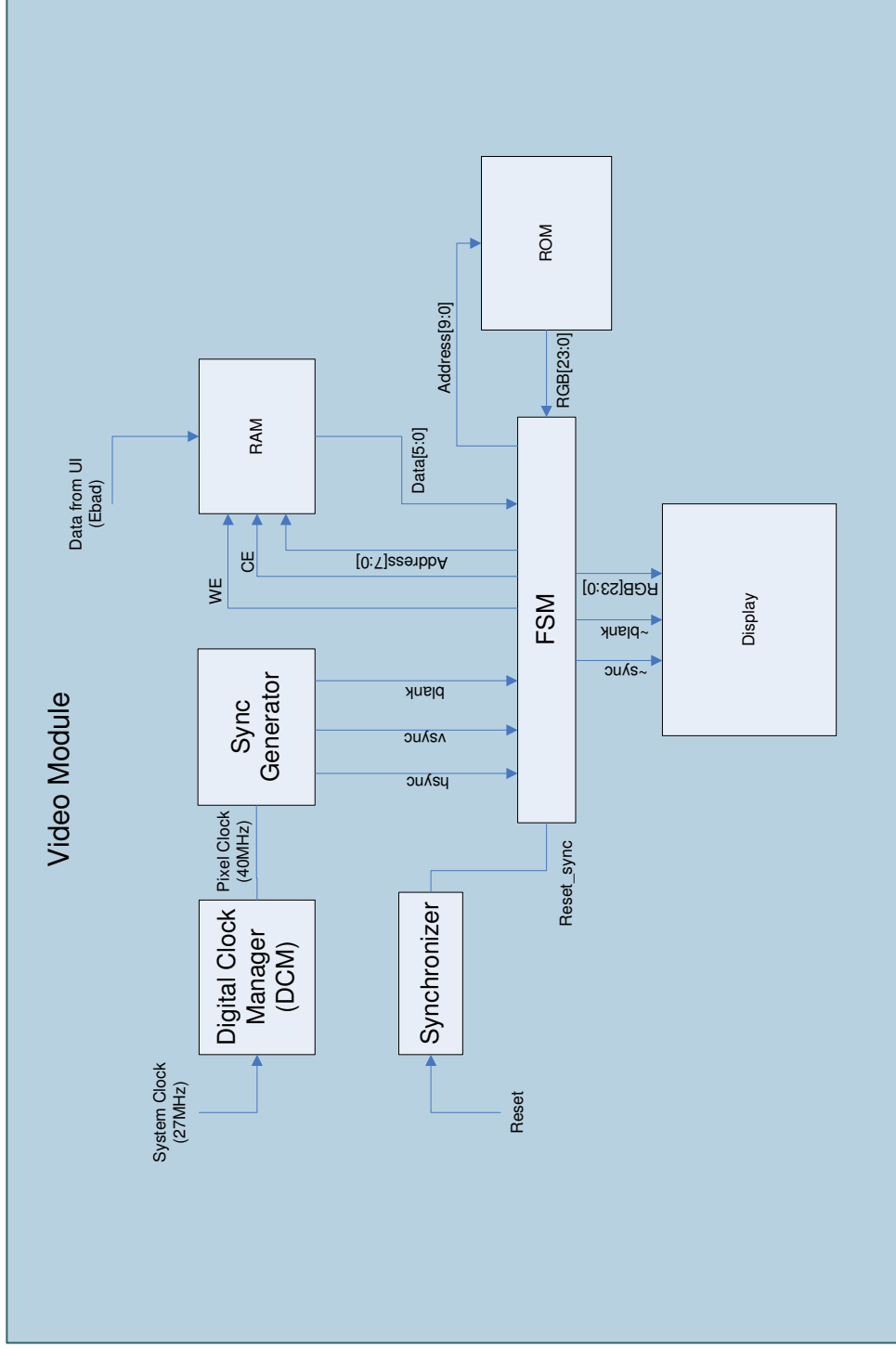
- Users interact with the core of the system through the user interface
- Three main features available:
 1. Select/Play a particular AM channel
 2. Pause/Replay a live transmission
 3. Bookmark favorite channels



Block diagram for the User Interface



Implementation of Video

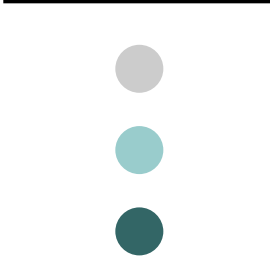




Implementation of Video

Video Display will:

- 1. Display AM radio station information
(ie. Name, Number, Category)**
- 2. Display a user menu so the user can customize the
Digital AM Receiver System**
- 3. Display the frequency content of the channel
(Fourier Transform)**



Time Line

- Individual Module Implementation
 - April 29
- System Integration
 - May 5
- System Enhancements/Debugging
 - May 8