Course: Multimedia Processing

Sem: VII

By

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UNIT - II
DIGITAL TELEVISION AND DISPLAY DEVICE

- Advantages of Digital Television
- Disadvantages of Digital Television
- Details of Digital TV
- HDTV

Advantages of Digital Television

- Better picture quality
- High reliability using digital ICs
- Software controlled processing
- Supports teletext and view data
- TV games supported

Disadvantages of Digital TV

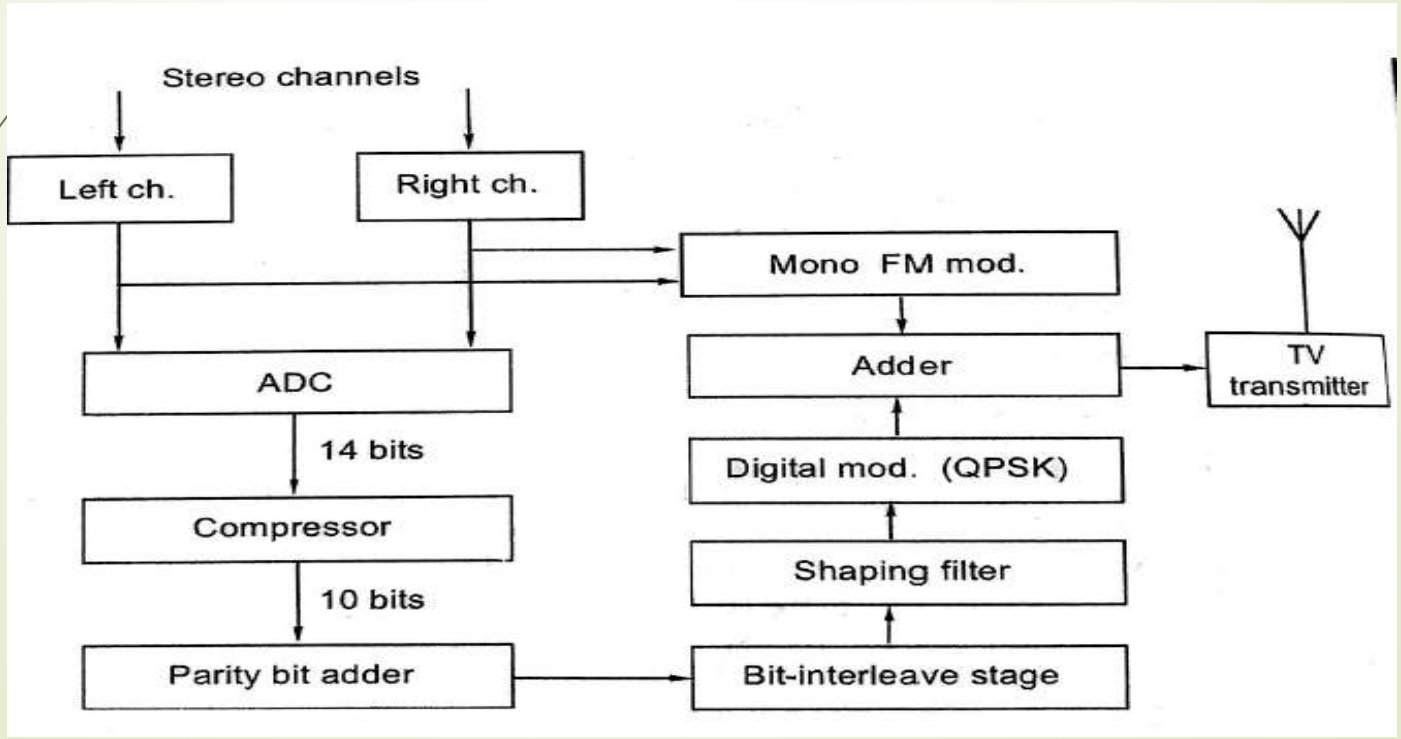
- Requires special equipment
- Needs digital converter box
- Signal loss may occur in poor conditions

Principle of Digital Television

- Video signal converted using ADC
- Digital processing performed
- DAC reconverts digital signal to analog
- Noise can be removed easily

Digital Television (DTV)

- Transmission of television signals using digital broadcast
- Improved picture and sound quality
- Efficient bandwidth usage



Digital Television (DTV)

- Receiver

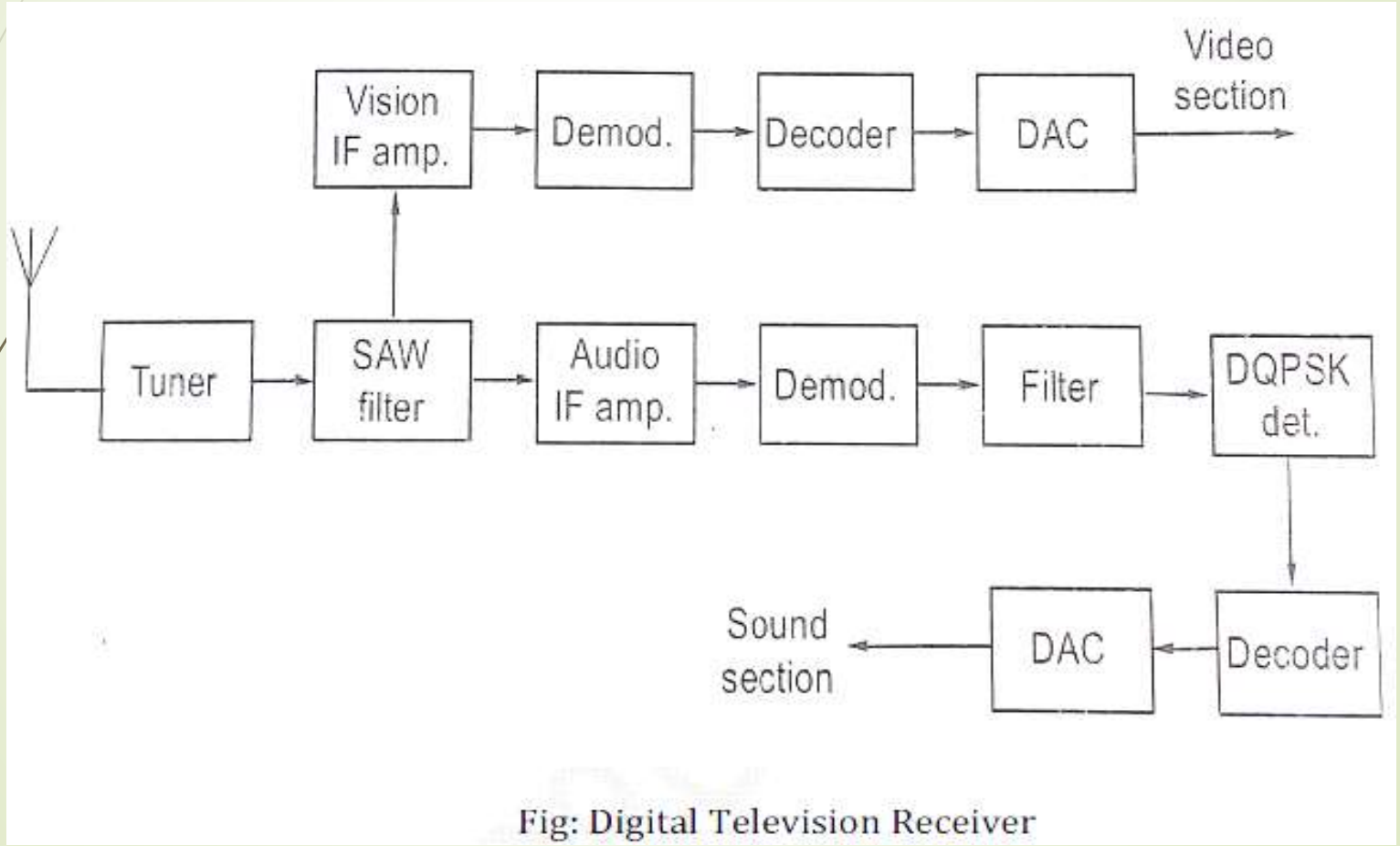
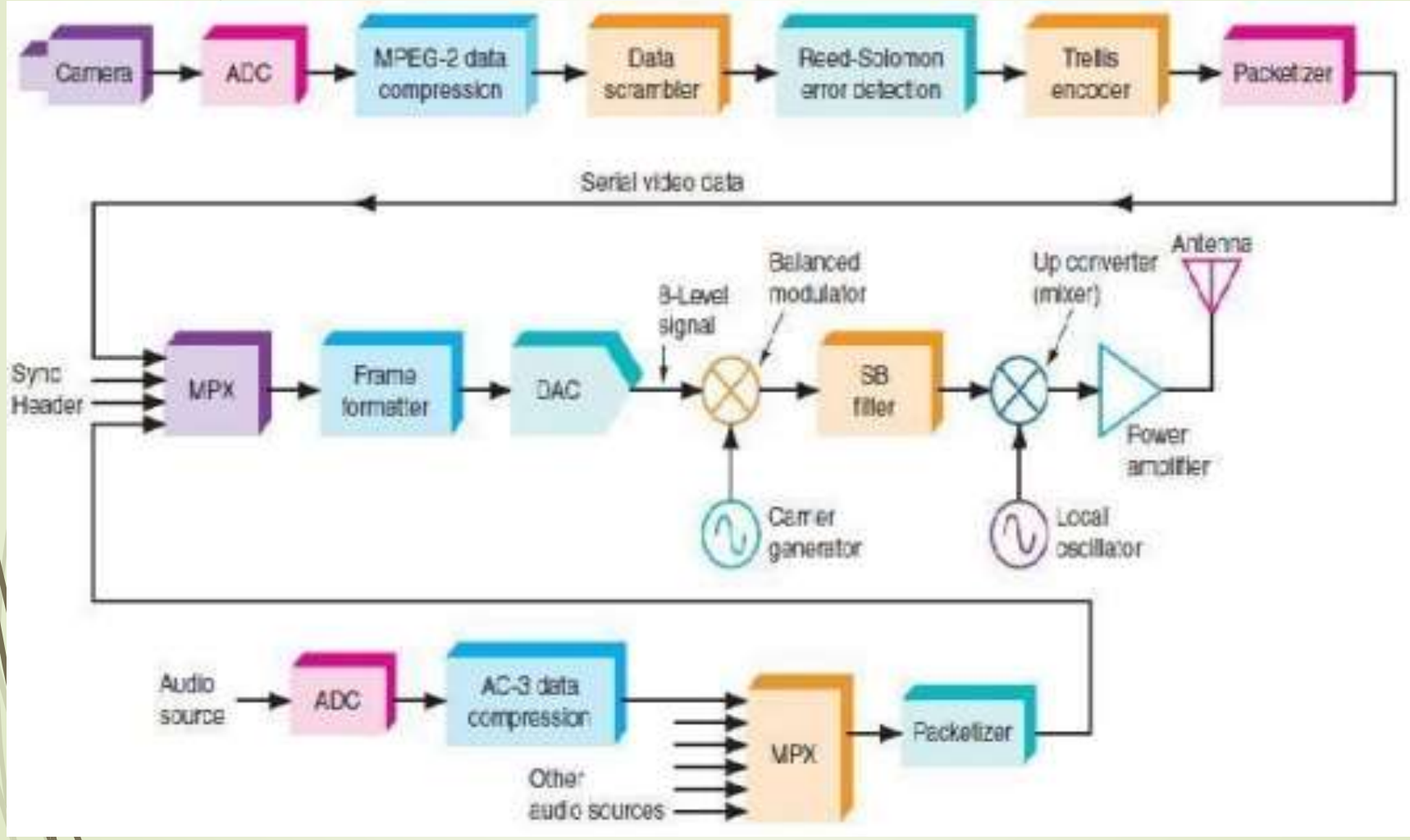


Fig: Digital Television Receiver

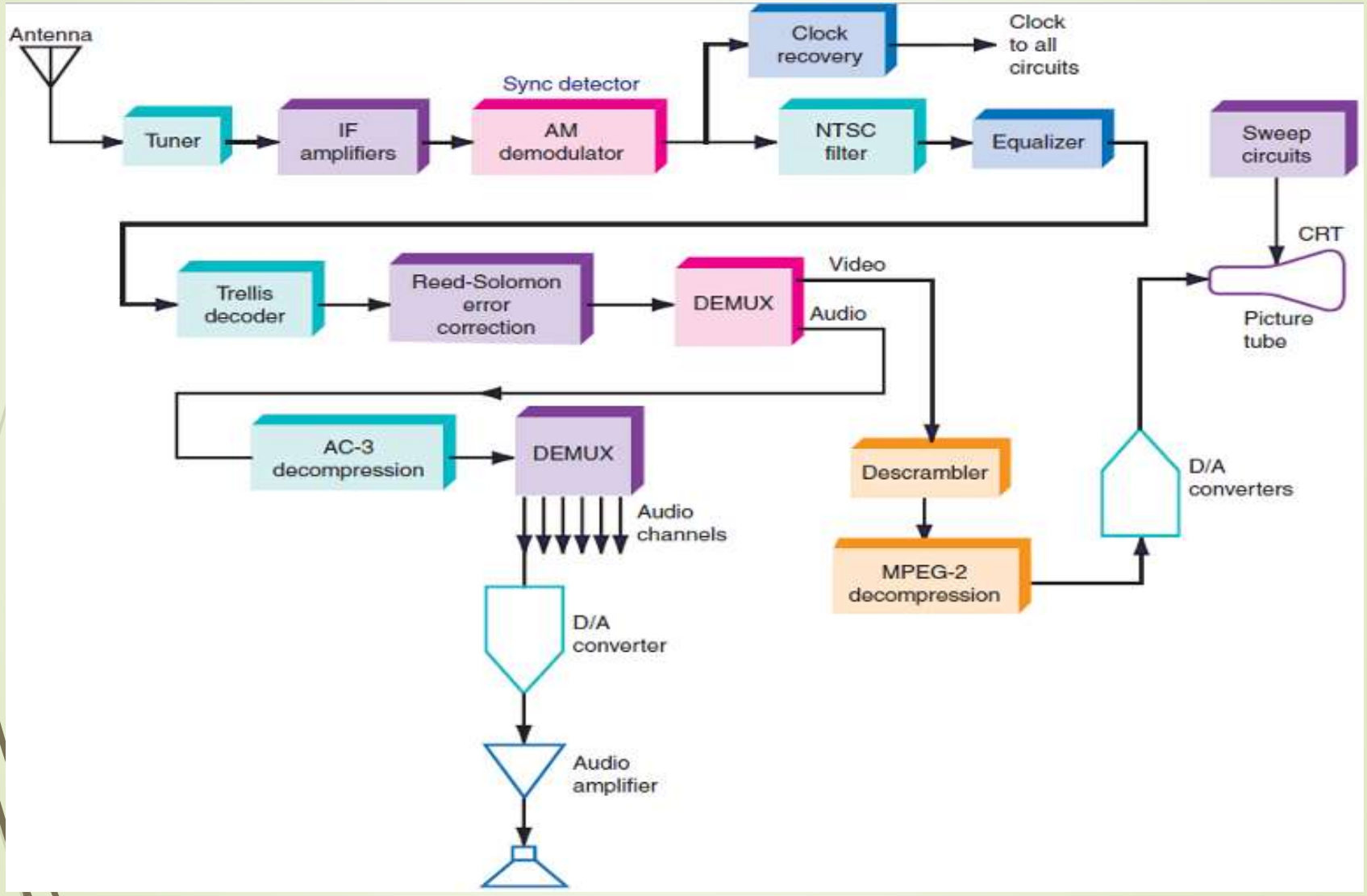
High Digital Television (HDTV)

- Wide screen TV system in which the size of the screen is 1 meter or more ca give real life size display as on a cinema screen.
- The large size give naturalness to the display and is more enjoyable than display on small screen.

HDTV- Transmitter



HDTV- Receiver



Digital Video Compression Techniques

- Video data is displayed as a sequence of static frames or interlaced fields.
- Video sequences contain **temporal and spatial redundancies** used in compression
- **Temporal compression** removes redundancy between consecutive frames
- **Spatial compression** removes redundancy within a single frame or field.

Spatial compression

- It is based on static image compression techniques.
- The image is divided into small blocks and transform is applied to each block.
- The transformed data is resized, quantized, and compressed using entropy coding to generate the bitstream.
- Common methods include Discrete Cosine Transform (DCT), fractal compression, vector coding, and wavelet transform.

Temporal compression

- It reduces redundancy by comparing consecutive video frames.
- If no motion is detected, the system copies data from the previous frame to the current frame.
- When changes occur, a prediction technique compares regions with previous frames.
- The difference between frames is encoded using transform coding to reduce data size.

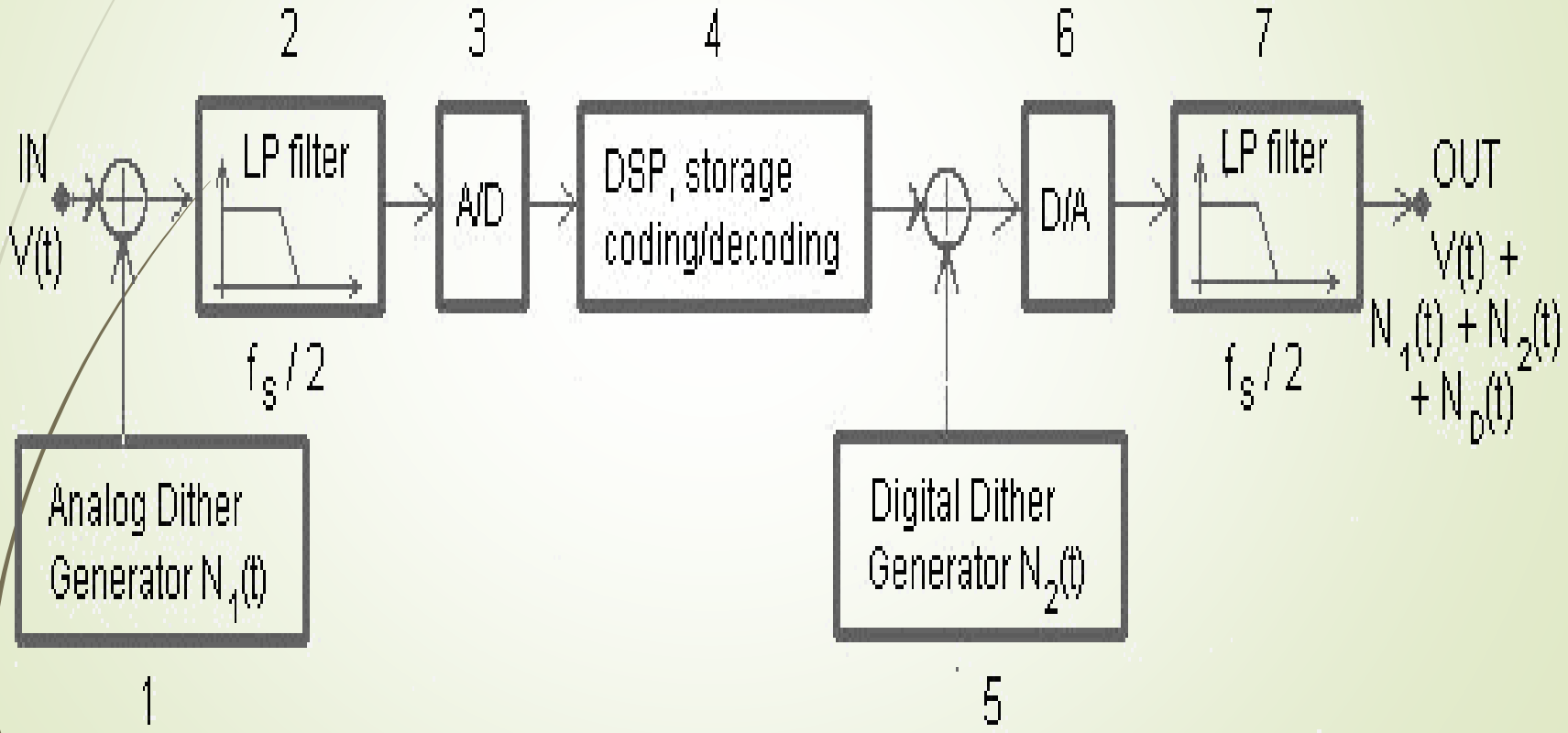
Display Devices

- Used to convert electrical signals into visible images
- Example: CRT, LCD, LED displays

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Digital Recording System



Basis of Difference	LCD	LED Display
Full form	LCD stands for Liquid Crystal Display.	LED stands for Light Emitting Diode.
Definition	The ‘LCD’ is a combination of solid and liquid states of matter which is used to display the information in the form of texts and images.	The ‘LED’ is a PN junction diode which emits visible light when the electric current flows through it. This light is then used as the backlight for displaying the information in the form of texts and images.
Backlight	LCD uses cold cathode fluorescent lamp (CCFL) as backlight.	LED display uses light emitting diode (LED) to provide the backlight.
Switching speed	LCD is slower than LED.	The switching speed of LED is more than LCD.
Response time	LCD has high response time, hence their switching speed is less.	The response time of LED is less than LCD, thus the LED is better than LCD in terms of response time.
Material	The liquid crystals and glass electrodes are used for manufacturing of LCD.	In case of LED, the gallium arsenide phosphide is used for manufacturing
Power consumption	LCD consumes less power than an LED.	LED consumes relatively more power