ELECTRONIC COMMUNICATION

DEPARTMENT OF PHYSICS (SF)

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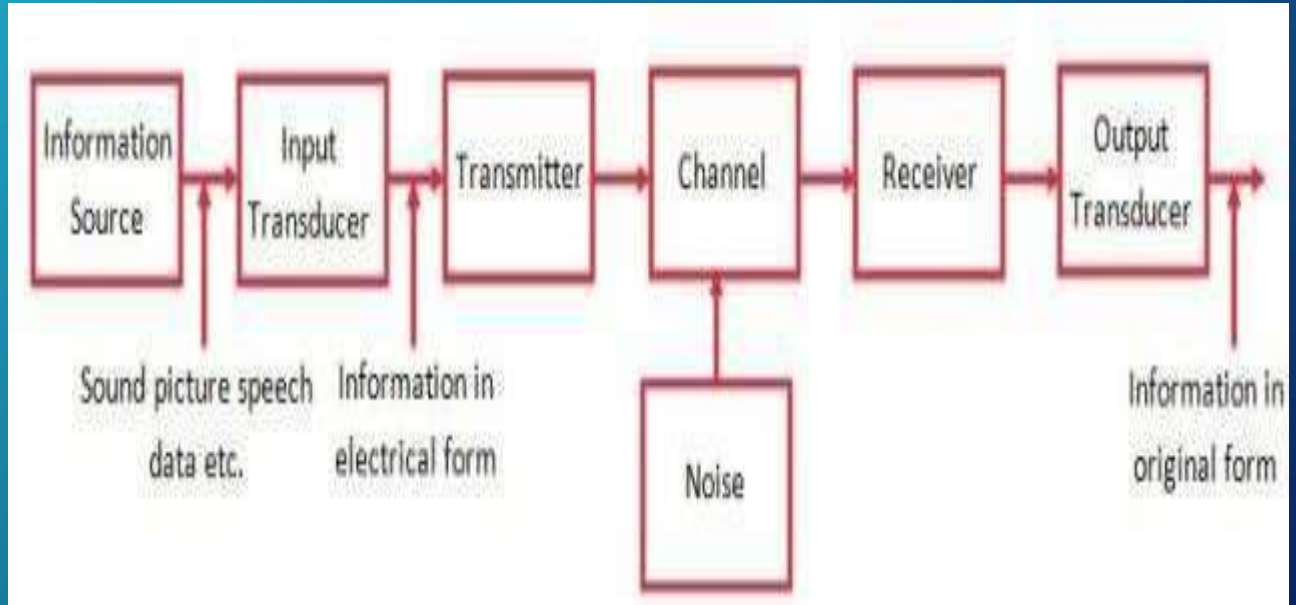
BlockDiagram Of Basic Communication System

- Basic elements: Transmitter Communication media and Receiver.

1. Information or Input
2. Input Transducer
3. Transmitter
4. Communication channel or media Wire or line, Radio noise
5. Receiver
6. Out put Transducers



Classification Based on the Technique of signal Transmission

- Two types of communication system
- 1. Base band Transmission System
- 2. Communication System using Modulation
- **Base Band signal or Base band Transmission:**
- Input or signal can analog or can digital.
- Electrical equivalent of original signal is base band signal.
- In base band transmission signal base band signals are directly transmitted
- **Limitations:**
- Can not used for radio transmission

Classification Based on the Technique of signal Transmission

- **Communication System using Modulation:**

✓ Base band signals called modulating signal and another high frequency called carrier signal.

✓ Carrier signals carry modulating signals to destination

✓ Need of Modulation (Modulating process has following advantages)

❖ Reduction in height of antenna

❖ Avoid Mixing of signals

❖ Increase range of communication

❖ Multiplexing is possible

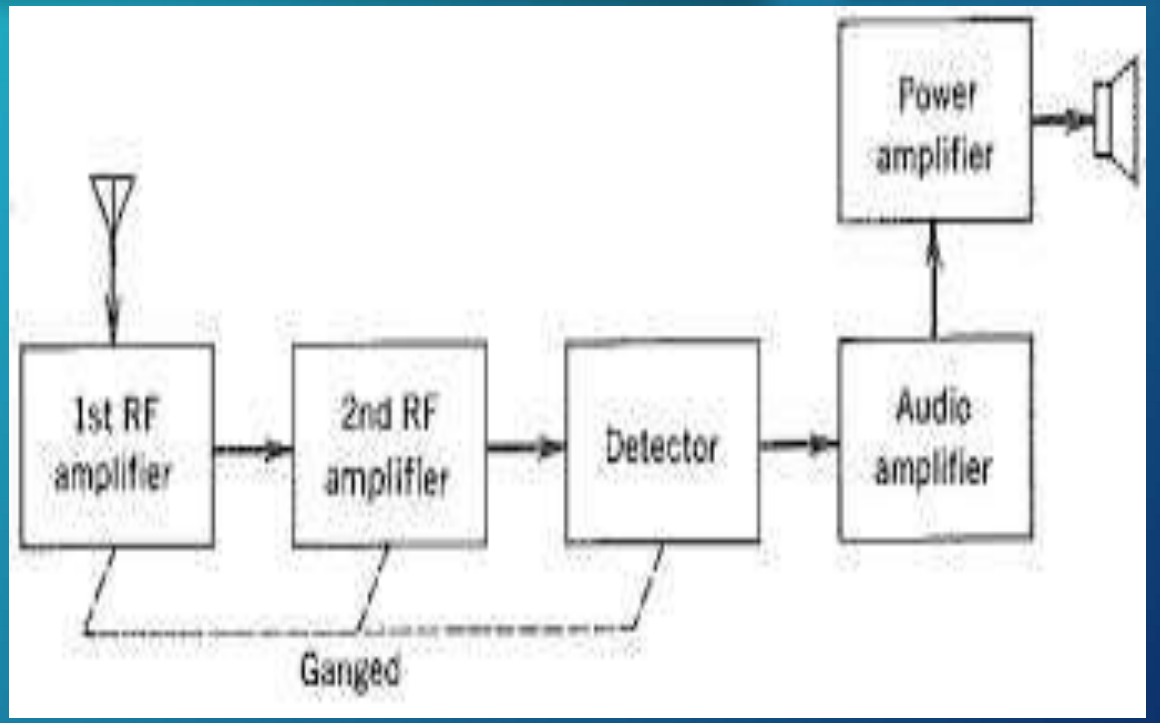
❖ Improves quality of reception

A M Receiver

- **Functions of receiver are:**
  - Select desired signals from all other unwanted signals
  - Amplify desired signals
  - Demodulate amplified signals
  - After demodulation original signals are amplified
  - Amplified signals are given to loud speaker

TRF Receiver (Tuned Radio Frequency)

- **Two types of Receiver are:**
  1. TRF
  2. Superheterodyne
- TRF Receiver
- Two tunable RF amplifier all tuned simultaneously to desired signal frequency
- Working/Operation:
- AM transmission takes in Medium wave(MW) and Short wave band(SW) frequency range from 530KHz to 1640 KHz



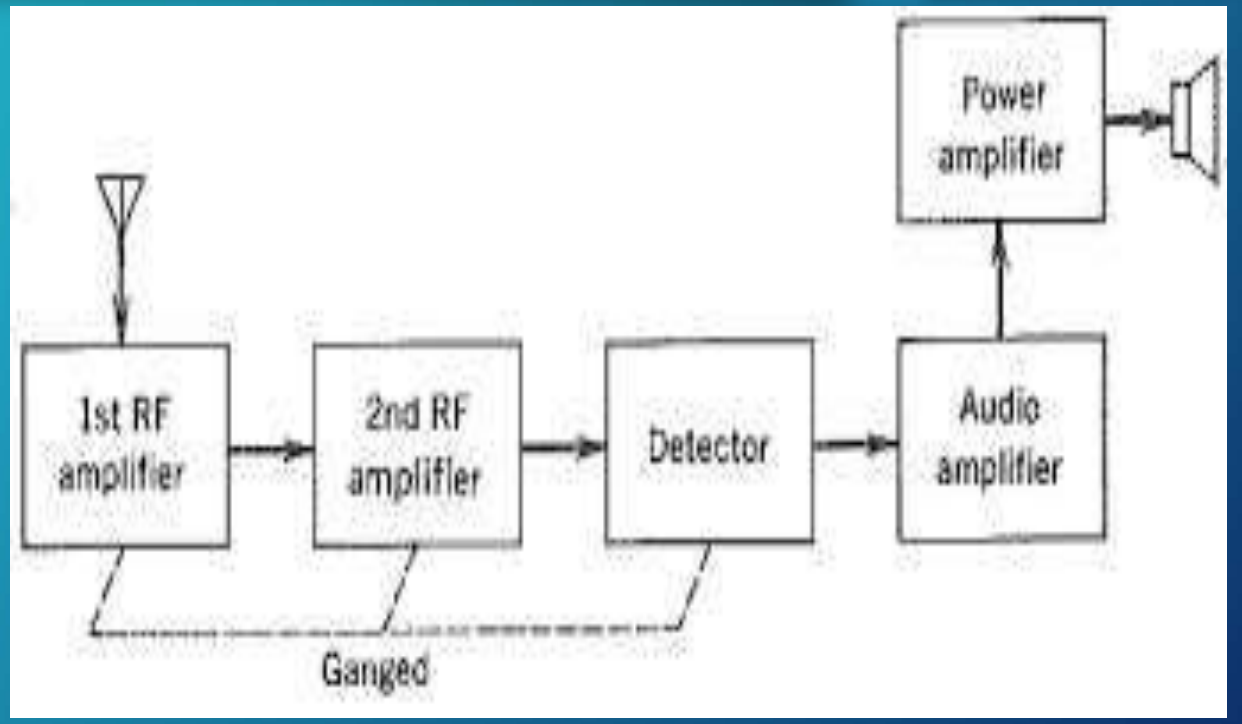
TRF Receiver (Tuned Radio Frequency)

- Various radio stations operates at different frequencies in this range

1. Due to EM ,voltage is induced

2. RF amplifier tuned simultaneously to select and amplify desired signals

- Tuning means adjusting resonating frequency and Ganged tuning means tuning simultaneous.
- Amplified signals demodulated by detector ,carrier bypass and modulating recovered.

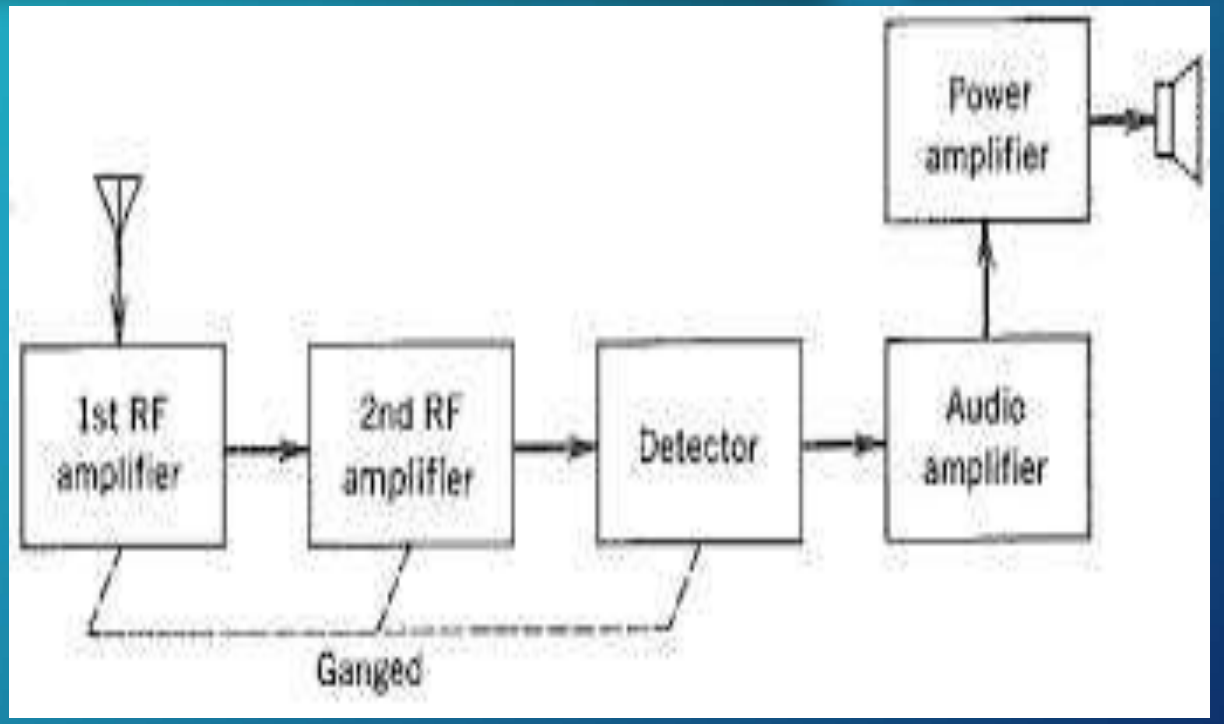


TRF Receiver (Tuned Radio Frequency)

4.Detected signal amplified(audio amplifier) and power amplifier and send to loud speaker

Problems

- Instability
- Variation in band width over tuning range
- Insufficient selectivity at high frequencies



Superheterodyne Receivers

- Problem in TRF is solved using Superheterodyne receiver by converting RF signals to IF , contains modulation
- Operation:
- 1. RF amplifier is used to select wanted signal and reject all other signals
- 2. Mixer mixes RF (fs) and local oscillator (fo) to provide IF
- $IF = (f_o - f_s)$

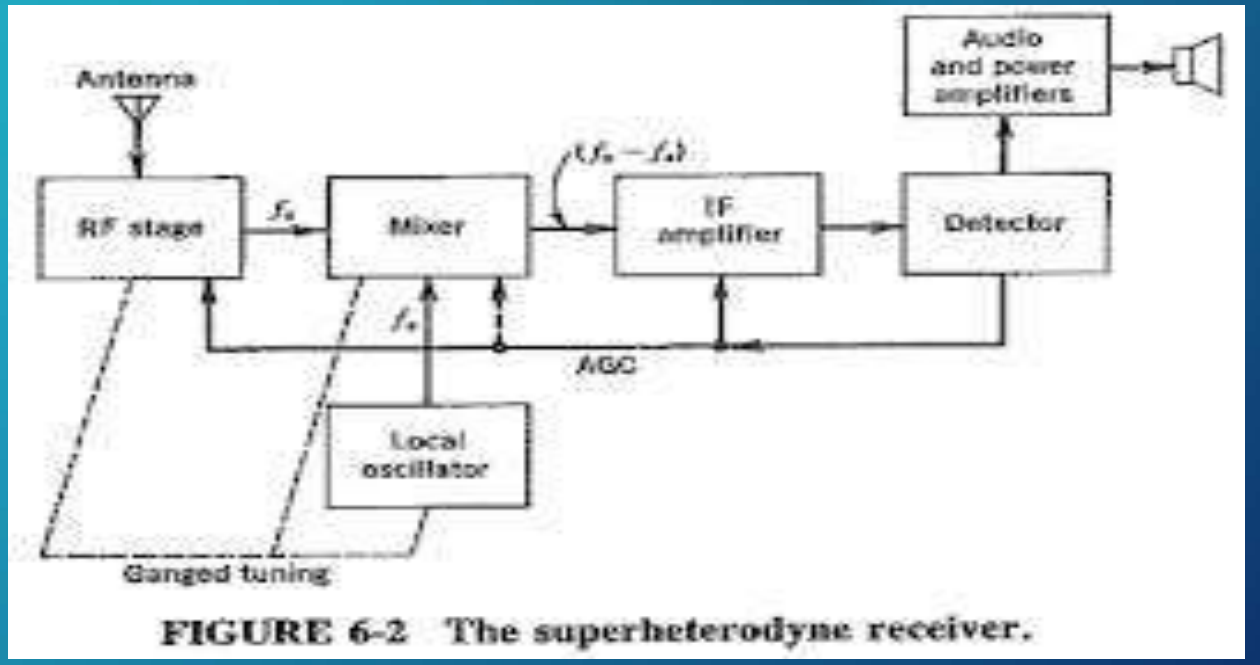


FIGURE 6-2 The superheterodyne receiver.

Superheterodyne Receivers

- ✓ IF amplifies and provides most gain (selectivity) and bandwidth requirement
- ✓ IF signals detected (detector)

Characteristics:

- ➢ Sensitivity: Ability to amplify weak Signals Measured in μv or decibel
- ➢ Selectivity : Ability to reject unwanted signals
- ➢ Decides adjacent channels

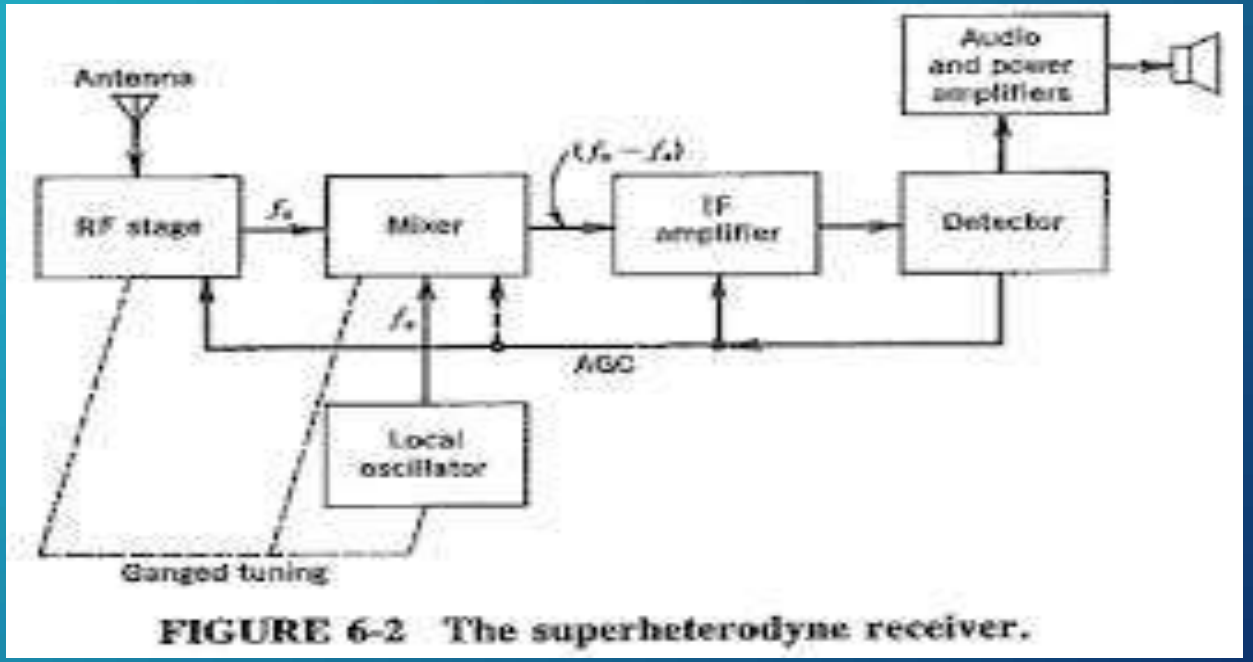


FIGURE 6-2 The superheterodyne receiver.

Super heterodyne Receivers

Fidelity: Ability of receiver to reproduce all modulating frequencies equally depends on frequency response of RF amplifier.

High fidelity means good quality music.

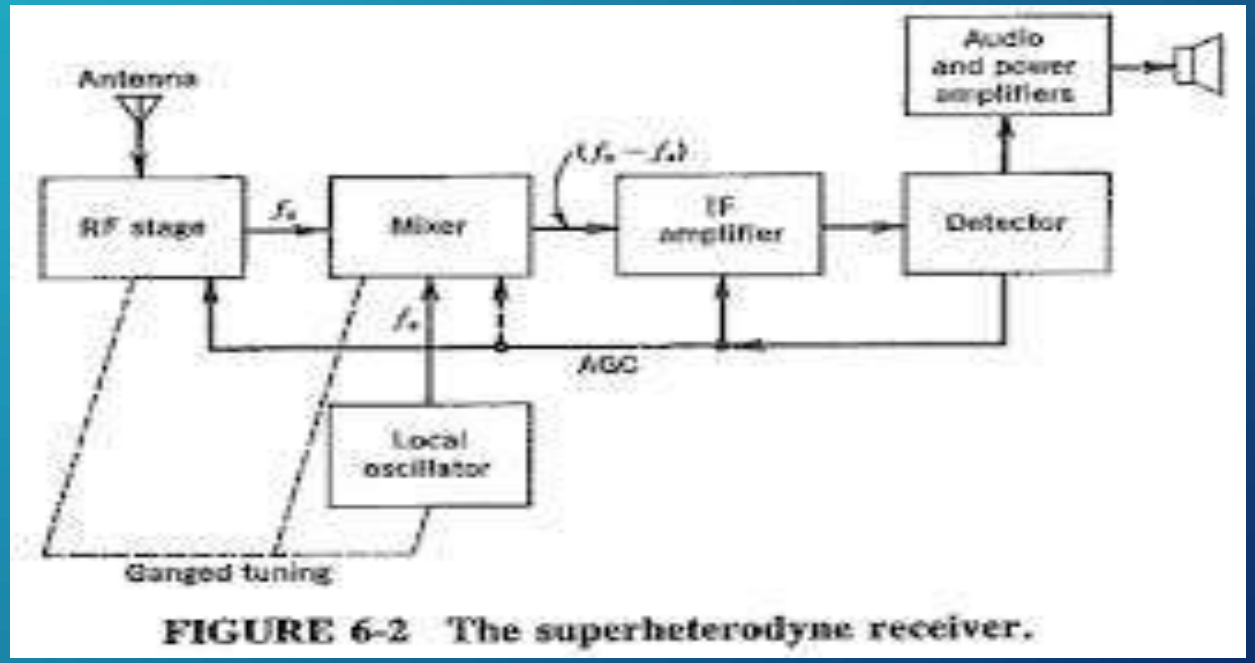


FIGURE 6-2 The superheterodyne receiver.

THANK YOU