

Feedback and its Applications

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Positive Feedback

- ✗ Positive feedback : If feedback signal is applied in such a way that it is in phase with the input signal and thus input signal increases, then it is called as positive feedback.

The application of positive feedback is in oscillators.

OSCILLATORS INTRODUCTION

- ✗ An oscillator is an amplifier, which uses a positive feedback and without any external input signal, generates an output waveform of a desired frequency.
- ✗ An oscillator is basically a waveform generator which generates an output waveform, which oscillates with constant amplitude & constant desired frequency.

TYPES OF OSCILLATIONS

- ✗ **Damped oscillation**
- ✗ **Undamped or sustained oscillation**

The electrical oscillation whose amplitude goes on decreasing with time are known as damped oscillation.

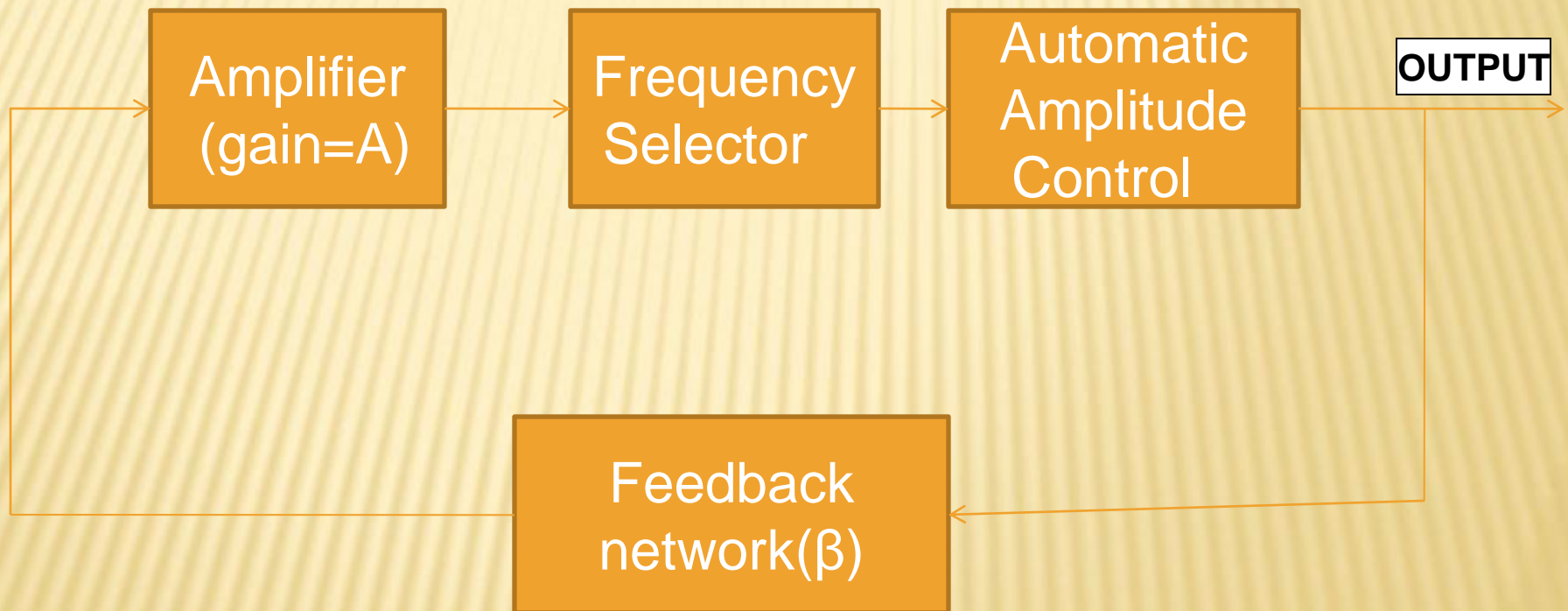
The electrical oscillations whose amplitude remains constant with time are known as undamped oscillations.

Conditions for oscillations

BARKHAUSAIN Criterion

1. The loop gain $|A\beta| = 1$.
2. The phase shift around the circuit must be 360 or 0 degree.

BASIC BLOCK DIAGRAM OF TRANSISTORIZED OSCILLATOR



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- ✗ **Oscillation circuit** it is basic tank circuit (LC circuit) which is used to produce frequency of oscillation

$$f = 1/2\pi(LC)^{1/2}$$

- ✗ **Electronic amplifier** receive dc power from battery & convert into the ac power for supply to the tank circuit.
- ✗ **Feedback network** it is supplied output part to tank circuit to the electronic amplifier.

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- ✖ **Frequency Selector:** Oscillator must be able to provide oscillation of any desired frequency , therefore frequency selector is provided.
 - ✖ **Automatic Amplitude Control:** If for any reason, the amplitude of oscillations in the output increases, it may continue to increase on account of feedback. Therefore to overcome this problem an automatic amplitude control unit is provided.