RIGA TECHNICAL UNIVERSITY

FACULTY OF ELECTRONICS AND TELECOMMUNICATION

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5G Wireless Technologies

Laboratory work 1

**Modulations and receivers**

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**Home task**

1. Write down an expression of amplitude modulated signal if modulating signal is a sine wave. Express it as a sum of harmonic spectral com-ponents. Append timing diagrams and spectra of the modulating and modulated signals.



Example:









Fig. 1. Modulating signal (top), Carrier signal (middle), AM modulated signal (bottom)



















Fig. 2. Modulating signal (top), Carrier signal (middle), AM modulated signal (bottom)

1. Draw the structure of the superheterodyne receiver. Assume it is supposed to receive AM signal. The modulating signal is s(t). Carrier’s frequency is f0, intermediate frequency — fIF. Write down expressions of the signals in each point of the diagram.



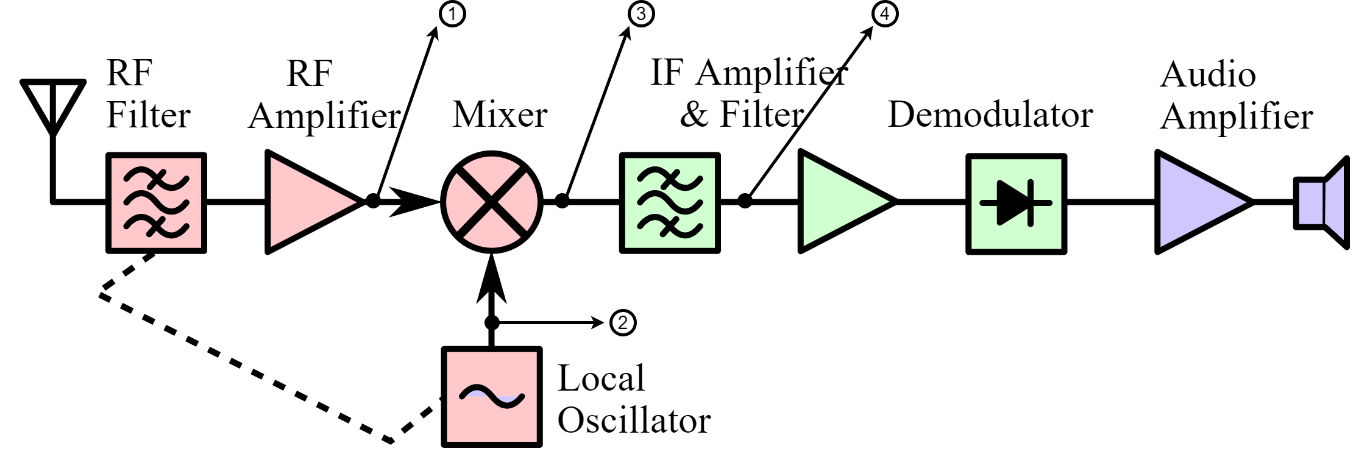


Fig. 3. Structure of the superheterodyne receiver

