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Advantages and Disadvantages of Homodyne Receiver

This page covers **Advantages and Disadvantages of Homodyne Receiver**. It mentions Homodyne receiver advantages or benefits and Homodyne receiver disadvantages or drawbacks.

What is Homodyne Receiver?

Introduction:

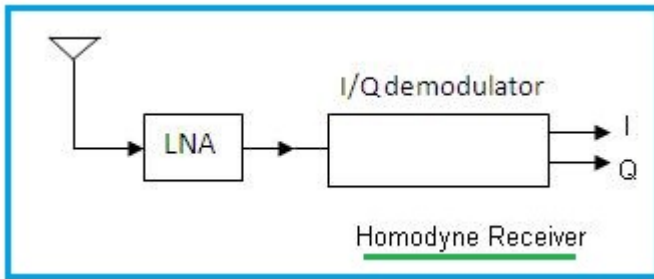
Homodyne receiver does not use any RF mixer for conversion of modulated RF signal to baseband I/Q signals. The baseband signals are at zero frequencies.

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The figure-1 depicts Homodyne Receiver architecture.

Homodyne receiver uses LO (Local Oscillator) frequency of same value as received signal frequency.

Refer [Homodyne Vs Heterodyne Receiver>>](#).

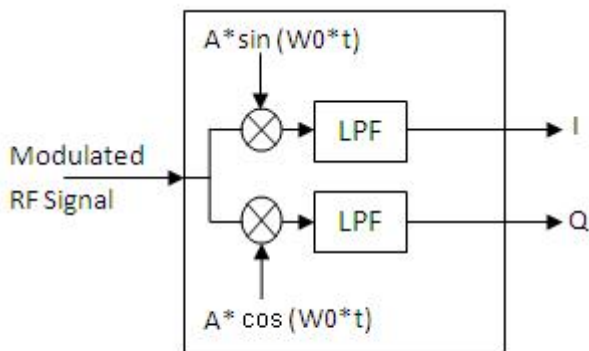


Fig.4 I/Q Demodulator Circuit

The figure-2 depicts IQ demodulator. As shown it converts modulated RF signal to baseband I and Q signals. Here W_0 equals $2\pi F_0$ where in F_0 equals F_c (Carrier Frequency) of received modulated RF signal.

Benefits or advantages of Homodyne Receiver

Following are the benefits or **advantages of Homodyne Receiver**:

- ➔ It uses same frequency for LO as transmit RF frequency for conversion to zero baseband I/Q signal frequency. Hence it is very simple architecture.
- ➔ The RF components such as LOs, RF mixers and filters are not needed like heterodyne receiver architecture.

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Hence cost of the homodyne receiver is less compare to heterodyne receiver.

Drawbacks or disadvantages of Homodyne Receiver

Following are the **disadvantages of Homodyne Receiver**:

➔ Homodyne receiver suffers from LO leakage. It should be as low as possible in order to retrieve baseband I/Q signals at zero frequency.

Also refer advantages and disadvantages of [Heterodyne and Super heterodyne receiver >>](#).

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