

8. Operational Description

Bluetooth

1. Sending

The sending base-band 1Mbps signal is divided into two signals, I and Q. DAC and filter remove unnecessary high frequency from signals. Besides, the signal at 2.4GHz after passing the first local oscillator goes through phase converter. And it is transformed phase difference-90 signal, goes into multiplication unit of I and Q. At Addition unit, GFSK-modulation occurs by adding I and Q. The modulated carrier waves go through balanced-unbalanced unit after amplification at amp. And the signal is sent after the harmonic waves from local oscillator and power amp distortion are removed from the signal by band-pass-filter.

Bluetooth

2. Receiving

At first, the disturbance electric waves outside of used band are removed from the input carrier waves by band-pass-filter. After going through balanced-unbalanced unit, the receiving signal is amplified by low-noise-amp and go into mix unit. And the signal is transformed the middle frequency at 1.5MHz after it is multiplied 1.5MHz lower signal than the carrier waves of 2.4GHz-band that double the frequency from the local oscillator of 1.2GHz-band. The middle frequency signal is removed disturbance electric waves inside used band by passing inside of bandpass-filter. After the signal at 1.5MHz from the second local oscillator is multiplied at multiplication unit, Q and I are added at addition unit. And added signal, Q, and I are demodulated to base-band signal after removing unnecessary high frequency by low-pass-filter.

3. Antenna location

There is an antenna inside the Personal Entertainment Organizer. It is impossible to remove the antenna and to change this.

IEEE802.11b

1. Sending

The sending base-band 11Mbps signal is divided into two signals, I and Q. DAC and filter remove unnecessary high frequency from signals. Besides, the signal at 4.9GHz generated by the local oscillator is divided into 2.45GHz sine and cosine wave by the phase shifter divider. I and Q signals are multiplied with 2.45GHz sine and cosine at the multipliers, and summed together at the adder to obtain the modulated carrier wave.

The modulated carrier wave goes through the programmable gain amplifier and the power amplifier.

The harmonic waves from local oscillator and the distortion of the power amp are removed by band pass filter after the power amp. After the BPF, transmitting signal goes to the antenna switch through a coaxial cable, and goes to the antenna through a coaxial cable.

IEEE802.11b

2. Receiving

Receiving signal from the antenna comes through a coaxial cable, antenna switch and another coaxial cable, into the wireless LAN module.

At first, the disturbance electric waves outside of used band are removed from the input carrier waves by band-pass-filter. After going through balanced-unbalanced unit, the receiving signal is amplified by low-noise-amp and go into multiplication unit. Besides, the signal at 4.9GHz generated by the local oscillator is divided into 2.45GHz sine and cosine wave by the phase shifter divider. They go into the multiplier of I and Q.

Q, and I are demodulated to base-band signal after removing unnecessary high frequency by low-pass-filter.

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