

TITLE OF INVENTION: ASYMMETRIC WIRELESS TRANSMISSION SYSTEM FOR COUNTERACTING ELECTRICAL INTERFERENCE

BACKGROUND OF THE INVENTION

5 1. Field of the Invention:

A wireless transmission system especially to one that is an asymmetric wireless transmission system for counteracting electrical interference.

2. Description of the Related Art:

10 The more commonly used communication methods are based on symmetrical channels, such as RFID (radio frequency identification) wireless communication, fiber optic communication, laser communication, etc. Wireless communication mainly includes microwave communication and satellite communication, it does not require wired transmission media, has fast transmission speed, and can directly communicate with multiple points. However, 15 since the transmitted information is exposed to the air, it is easy to be intercepted and security is difficult to guarantee. Fiber optic communication is a communication method that mainly relies on optical fiber to transmit signals, it has high reliability and fast speed, but it requires laying lines and is troublesome to install. Laser communication is a communication method that uses laser as a 20 transmission medium, it has large communication capacity, strong confidentiality, and a light structure, but it suffers from severe atmospheric attenuation and is difficult to aim.

However, it is found that the symmetrical channel wireless communication

system for military purposes is vulnerable to interference or interception by enemy radio waves.

SUMMARY OF THE INVENTION

5 A primary objective of the present invention is to provide an asymmetric wireless transmission system for counteracting electrical interference, which has the effect of making it not only more difficult for the enemy to detect, but also more difficult to interfere with.

10 In order to achieve the above objective, the present invention includes: an our back-end weapon system, having a first wireless communication device, and the first wireless communication device at least includes a first transceiver and a first processor; an our front-end weapon system, having a second wireless communication device, and the second wireless communication device at least includes a second transceiver and a second processor; wherein, the first wireless communication device sends a first modulation signal to the second wireless communication device and operates at a frequency (f_1), the second wireless communication device sends a second modulation signal to the first wireless communication device and operates at a frequency (f_2), and the first modulated signal is transmitted using a spread spectrum signal to have a high coding gain, thereby making it difficult for the enemy to detect and interfere with it.

20 Moreover, the larger the interval between the first modulation signal and the second modulation signal, the more difficult it is for the enemy to detect.

Whereby the present invention has the effect of making it not only more difficult for the enemy to detect, but also more difficult to interfere with.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a block diagram illustrating the structure and the process of the present invention;

FIG. 2 is a block diagram illustrating the structure and the process of the front-end and back-end weapon system of the present invention;

FIG. 3 is a spectrogram illustrating the co-channel interference of narrowband transmission;

FIG. 4A is a spectrogram illustrating the co-channel interference during transmission;

FIG. 4B is a spectrogram illustrating the relationship between the coding gain and the spectrum after de-spreading.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 1~4B, a preferred embodiment of the present invention includes: an our back-end weapon system **10**, having a first wireless communication device **100**, and the first wireless communication device **100** at least includes a first transceiver **101** and a first processor **102**; an our front-end weapon system **20**, having a second wireless communication device **200**, and the second wireless communication device **200** at least includes a second transceiver **201** and a second processor **202**; the above features belongs to prior art, so will not describe in detailed here. As FIG. 1 showing, our weapon systems are vulnerable to electronic warfare interference from enemy weapon systems **30**.

Referring to FIG. 2, the main features of the present invention is: the first wireless communication device **100** sends a first modulation signal **11** to the

second wireless communication device **200** and operates at a frequency (f_1), the second wireless communication device **200** sends a second modulation signal **21** to the first wireless communication device **100** and operates at a frequency (f_2), and the first modulated signal **11** is transmitted using a spread spectrum signal to
5 have a high coding gain, thereby making it difficult for the enemy to detect and interfere with it.

In this embodiment, the larger the interval between the first modulation signal and the second modulation signal, the more difficult it is for the enemy to detect.

10 In this embodiment, the first transceiver **101** of the first wireless communication device **100** can be used to transmit data (eg, package) or instructions to the second wireless communication device **200**, or receive data or instructions from the second wireless communication device **200**. In a preferred embodiment, the first transceiver **101** is a transceiver circuit supporting a preset
15 communication protocol. In the preferred embodiment, the preset communication protocol includes IEEE 802.11, but not limited to this application.

In a preferred embodiment, the first transceiver **101** can use spread spectrum technology to modulate the data to be transmitted and output the modulated data as a packet. For example, the first transceiver **101** may utilize direct-sequence
20 spread spectrum (DSSS) technology to modulate data to be transmitted (eg, a string) to generate a packet. The first processor **102** can be connected to the second wireless communication device **200**. In a preferred embodiment, the first processor **102** may be a digital signal processor in a baseband circuit system in

the first wireless communication device **100**, but not limited to this application.

Therefore, the asymmetric wireless transmission system of the present invention uses spread spectrum technology to counteract or suppress the adverse effects caused by "co-channel interference". As FIG. 3 showing, if general
5 narrowband transmission technology is used, the signal is easily subject to high-power co-channel interference during transmission, so the receiving end receives a composite signal of the transmission signal and the co-channel interference; because the power of the co-channel interference is stronger than the transmission signal, the transmission signal cannot be effectively identified.

10 On the contrary, if the spread spectrum technology is used, the signal spectrum is spread in some way before the signal is transmitted, and the co-channel signal interference during transmission is shown in FIG. 4A. At the receiving end, the previous spreading operation is operated, and the signal is restored to the original bandwidth range. Then the interference signal is spread
15 to a lower gain, so the original signal is easier to identify. The relationship between the coding gain and the spectrum after de-spreading is shown in FIG. 4B. Asymmetric wireless transmission systems use spread spectrum technology to counteract or suppress "co-channel interference"

Therefore, as shown in FIGS. 4A and 4B, the present invention uses an
20 asymmetric wireless transmission system and spread spectrum technology to counter or suppress "co-channel interference", which can make it more difficult for the enemy to detect and interfere with it.

Although particular embodiments of the invention have been described in

detail for purposes of illustration, various modifications and enhancements may be made without departing from the spirit and scope of the invention. Accordingly, the invention is not to be limited except as by the appended claims.

What Is Claimed Is:

1. An asymmetric wireless transmission system for counteracting electrical interference, includes:

an our back-end weapon system, having a first wireless communication
5 device, and the first wireless communication device at least includes a first transceiver and a first processor;

an our front-end weapon system, having a second wireless communication device, and the second wireless communication device at least includes a second transceiver and a second processor;

10 wherein, the first wireless communication device sends a first modulation signal to the second wireless communication device and operates at a frequency (f1), the second wireless communication device sends a second modulation signal to the first wireless communication device and operates at a frequency (f2), and the first modulated signal is transmitted using a spread spectrum signal to
15 have a high coding gain, thereby making it difficult for the enemy to detect and interfere with it.

2. The asymmetric wireless transmission system for counteracting electrical interference as claimed in claim 1, wherein the larger the interval between the first modulation signal and the second modulation signal, the more difficult it is
20 for the enemy to detect.