

Synetek Technology, Ltd.

2.4GHz Digital Wireless Stereo Headphones

with

Transmitter Cradle

SK-WHP28G

User Manual

Version 4.1

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## FCC Warning statement:

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This Transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Any changes or modifications (including the antennas) made to this device that are not expressly approved by the manufacturer may void the user's authority to operate the equipment.

### **\*\*Warning: Wireless Limitation and Power Consumption**

This headphone operates at 2.4G radio wave frequencies, and the unit is intended for use within the same room as the signal source. Obstacles such as walls reduce the effectiveness of the radio frequency wireless transmission. Refer to trouble shooting section to minimize interference. Even with advanced engineering and technology employed for minimal interference, the following sources are known to interfere with wireless transmission:

2.4G cordless phones when operating within 20 feet

Microwaves when operating within 15 feet

2.4G WiFi network when operating within 10 feet

Please keep adequate distance from interference sources to insure normal operation.

Headphone automatically mutes when strong interference is detected.

Power consumption level varies depending on transmission distance, background interference level, audio program played, and battery quality.

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## **Introduction**

SYNETEK is committed to achieve new performance standards in digital audio and video connectivity for consumers worldwide. We are able to respond fast to develop, launch and support innovative products featuring the most advanced digital audio and video technologies which enables the company to maintain strong brand royalty among current product users and to expand into new markets, gaining new customers.

Furthermore, we are aware of evolving trends within the mainstream consumer and business user markets allowed for the introduction of many products that have earned countless awards from leading industry publications and gained early customer acceptance.

SK-WHP28G utilizes the global 2.4G wireless standard for enabling wireless connections. It is a simple and instant radio solution that allows different devices to talk to one another. SK-WHP28G eliminates the need for any cable between devices such as audio source and the headphone. SK-WHP28G facilitates fast and secured audio transmission between devices even if they are not in line-of-sight. SK-WHP28G operates at low power and has a range of 30 to 100 feet (Line of Sight).

### **Applications suitable for SK-WHP28G:**

- Audiophile Deck
- Television
- DVD Player
- Home Theater System
- Game Console
- MP3 Player
- Common audio source supplied in analog signal

## Package List

Thank you for choosing SK-WHP28G 2.4G Wireless Stereo Headphones kit. It is unique and different from most wireless headsets in the market for its good integration of audio stream.

The following checked items should be in the package.

Items	Quantity
<input type="checkbox"/> Headphones with built-in receiver	1
<input type="checkbox"/> Digital RF transmitter with 3.5mm stereo connector	1
<input type="checkbox"/> AC Power adapter	1
<input type="checkbox"/> 3.5mm stereo line to RCA adaptor cable	1
<input type="checkbox"/> Rechargeable Batteries	2
<input type="checkbox"/> User manual	1

## Features

- Pure digital 2.4G wireless transmission for high fidelity quality
- Quality headphone for comfort wear and dynamic sound quality
- Zero data compression for lossless sound quality and minimal delay
- Compatible with regular RCA audio jack, or 3.5mm stereo jack source
- Wireless transmission 30 to 100 feet (line of sight)
- Stylish transmitter cradle for holding headphone
- 16 wireless channels with auto scan to minimize interference
- Digital forward error correction for clear sound
- Co-exist with WiFi Wireless LAN, Bluetooth device, and cordless phone
- Embedded antenna for best reception
- Low power consumption design to ensure 4 to 8 hours of operation \*\*

## Headphones Receiver / Digital RF Transmitter drawing

## Installation guide

- Plug the SK-WHP28G Digital RF Transmitter into the audio line-in source found on Television, Laptop/PC headphone connector, DVD player, Game Console, or any audio line-out source. Use the 3.5 mm stereo plug for 3.5mm stereo jack. For RCA stereo jack, connect the RCA stereo adaptor line to the RCA stereo jack.
- Turn on the power switch on the Digital RF Transmitter.
- Open the battery cover on the left hand side of the headphones, and insert two AAA batteries with proper direction and close the battery cover.
- Turn on power switch on the headphones.
- LED light indicator on the transmitter and headphone indicates proper operation.
- Turn on audio player to hear the high quality sound from headphones.
- Always start headphones from lowest volume, and then adjust volume to adequate level to protect from over-stressing ears. Prolonged listening of any earphone may cause over-stress in ears.

### Note:

Frequency switch button on transmitter – The button is used for the user to change working frequency manually to avoid the noise in case there has interference.

## Technical Specification

- Sampling Rate ( $f_s$ ): 32KHz/44.1KHz/48KHz
- Input Clock: 12MHz/12.288MHz/16.9344MHz/18.432MHz ( $384 \times f_s$ )
- Un-compressed digital audio signal for highest sound quality
- Operating Frequency of ISM band 2.4-2.4835 GHz
- On 16 selectable Channels with auto scan for available clear channel
- Transmit Rang 30-100 Feet (Line of Sight)
- Audio Frequency Response: 20Hz~20KHz (+/-1 dB)
- With no data compression for the best audio quality and low latency
- Dynamic Range : 85 dB
- Transmit Power : +17dBm
- Receive sensitivity : -83dBm
- Audio Input Level : 4Vpp (max)
- Audio Output Level : 3Vpp (max)
- Avoids reception errors by employing forward error correction and error control
- Coexist with Wireless LANs, Blue Tooth and other ISM band devices
- Embedded Antenna
- Digital Volume Control
- Forward Error Correction
- Transfer rate of Control Information: 3.8Kbps – 7.9 Kbps
- Auto-mute upon detection of strong interference
- Auto-power-down
- Auto Channel Searching
- Operating Conditions.....Supply Voltage (VDD01, VDD02, VDD03, VCCPLL) ..... +3.0V to + 3.6V
- Operating Ambient Temperature ( $T_a$ )..... 0 to +80

## **Electrical Characteristics**

Parameter	Test Condition	Min.	Typ.	Max.	Unit
<b><u>Power Supply</u></b>					
Supply Voltage		3.0	3.3	3.6	V
Operating Current	@ 3.3V		25		mA
<b><u>Data Voltages</u></b>					
High Level Input Voltage		2.4			V
Low Level Input Voltage				0.7	V

## **Channel Frequency**

SK-WHP28G supports a total of 14 Channels. In the table below, the frequency of Channel 4 is equal to the frequency of Channel 14. And the frequency of Channel 6 is equal to the frequency of Channel 16.

Channel Number	Transmitter	Receiver
1	2467.0 MHz	2456.3MHz
2	2414.5 MHz	2403.8 MHz
3	2441.1 MHz	2430.4 MHz
4	2463.2MHz	2452.5 MHz
5	2425.9 MHz	2415.2 MH
6	2455.6 MHz	2444.9 MHz
7	2433.5 MHz	2422.8 MHz
8	2459.4 MHz	2448.7 MHz
9	2418.3 MHz	2407.6 MHz
10	2448.0 MHz	2437.3 MHz
11	2422.1 MHz	2411.4 MHz
12	2451.8 MHz	2441.1 MHz
13	2429.7 MHz	2419.0 MHz
14	2463.2 MHz	2452.5 MHz
15	2437.3 MHz	2426.6 MHz
16	2455.6 MHz	2444.9 MHz



## FAQ and Trouble Shooting

### 1. Earphone is not working?

The battery may be running low. Switch with new battery to solve this problem. Also see *poor reception* and *out-of-sync* help.

### 2. Earphone is having poor reception?

The battery may be running low. Switch with new battery to solve this problem. There may be strong interference source too close too the unit. Follow interference minimizing guidelines on the inside of cover page. Also use the manual channel switch to switch for clear channel.

### 3. Earphone may be out of sync with the transmitter?

Turn-off both Digital Transmitter and Headphone unit. First turn on the Digital Transmitter. Wait for 5 seconds, and then turn on the Headphone unit. The transmitter and headphone pair will automatically recognize each other and become in-sync.

### 4. What is ISM Band?

The Industrial, Scientific and Medical (ISM) radio bands are the industrial equivalent of the "Citizens Band". No license is required. Every country has different regulation. 2.400-2.483.5 GHz is common worldwide.

### 5. What is Digital RF Audio?

Pure digital method to transfer audio maintains the best quality post transmission. The obsolete method with analog FM transmission has poor audio quality on receiver.

### 6. RF interference

Due to ISM 2.4Ghz is unlimited radio band, there are many equipments are using in the same band. The user has to careful to use the device to keep the best performance. In 2.4Ghz ISM, there are WLAN, Bluetooth, and Cordless phones. Microwave oven emits radio wave in the same band. In order to avoid RF interference, use the "Channel Select" switch in transmitter for user to change working frequency if it needed.

7. How to avoid WLAN interference

WLAN is using SST technology for transmission and occupies 20Mhz per channel. In order to avoid the interference with WLAN, the WLAN user could turn on WLAN utility to check the working channel for WLAN and switch to the right channel for 2.4G wireless headphones to avoid the interference from WLAN.

8. Number of working frequency: 16

9. Frequency selection for SYNETEK 2.4G wireless headphones:

Manual select on transmitter, Auto scan on receiver. User could select working frequency by push the channel select switch on transmitter and receiver will change accordingly.

## WARRANTY AND R.M.A POLICY

### General Warranty

\* SYNETEK Ltd. provides one (1) year warranty for parts and sixty (60) days for labor for all products from the date of invoice by repairing or replacement. This warranty shall not extend to any damage, defect, or malfunction caused by abuse, misuse, or unauthorized modification by the customer. "SYNETEK" reserves the right to refuse service due to any physical damage.

\* There will be a 15% restocking charge if merchandise that meets manufacturer's specifications is returned for reasons of "general dissatisfaction with performance" or incompatibility with hardware or software within fifteen (15) days from the date of invoice and must be returned in the original condition as sold. Absolutely no return for credit after 15 days from the date of invoice, and no cash refund.

### RMA Policy

\* Products proved defective during the warranty period will be replaced or repaired by "SYNETEK"

\* Defective products will only be tested for the problem reported. If no specific problem was reported, only "SYNETEK"'s general testing procedures will be applied.

\* Any products do not found to be defective will be returned to the customer as is.

\* "SYNETEK" will not be responsible for the physical damage, due to improper packing, or incurred during the transportation from the "Customer's Site" to "SYNETEK". Any damage claims against the shipping company are the responsibility of the Customer.

\* If the in house credit will be issued, it is based on the product's current market price. Not the original Invoice selling price.

### Technical Support

If you have further questions, please contact our Technical Support Department.

Thank you!

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