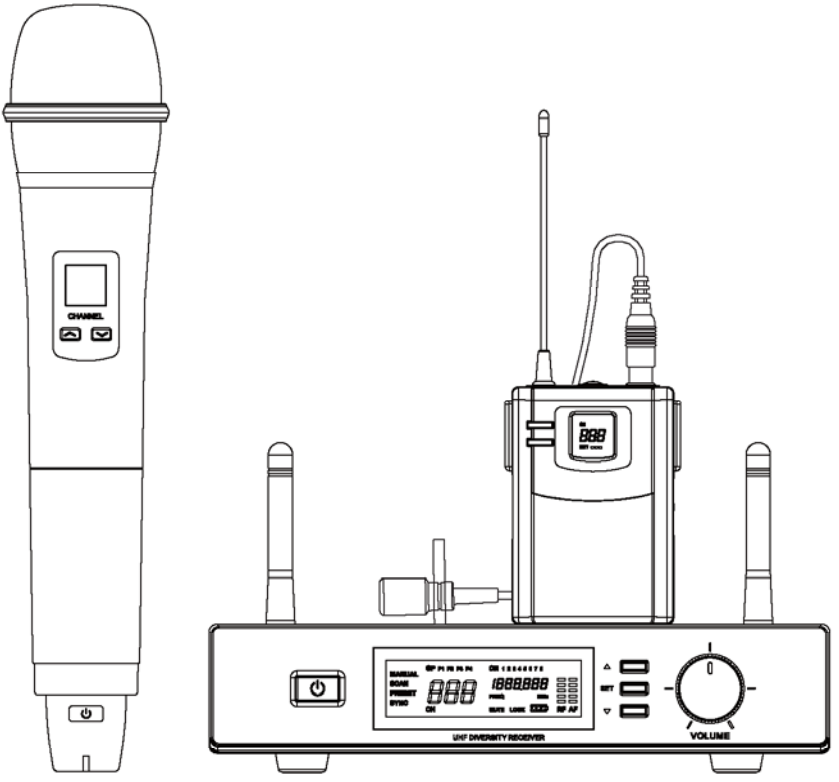
speco technologies

UHF PLL SYNTHESIZED

USER'S MANUAL

UHF BAND
WIRELESS MICROPHONE SYSTEM



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WIRELESS MICROPHONE SYSTEM

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FCC Statement

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1)This device may not cause harmful interference and (2) This device must accept any interference received, including interference that may cause undesired operation

Notice : The changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

IMPORTANT NOTE: To comply with the FCC RF exposure compliance requirements, no change to the antenna or the device is permitted. Any change to the antenna or the device could result in the device exceeding the RF exposure requirements and void user's authority to operate the device.

1. Introduction

Thank you for purchasing our product. This wireless microphone system operates in the UHF band frequency with synthesizer control. This system with 700 selectable frequencies via Phase Locked Loop (PLL) circuitry makes it easy to choose non-interfered channels. (The number of frequency channels depends on local regulations.) Please read this instruction manual carefully before operating the system. This manual covers the function and operation of the wireless microphone system.

2. Safety

- Do not spill liquid on the appliance and do not drop it on a hard floor.
- Do not place the appliance near heat sources such as radiators, amplifier, etc. Do not expose it to direct sunlight, extremely dust, excessive moisture, or vibration.
- Take the battery out from the transmitter if the appliance will not be used for a long period. This will avoid damage that could result from a defective or leaking battery.

3. Environment

- Do not throw used batteries into a fire or garbage bin. Be sure to dispose of used batteries in accordance with local waste disposal rules.
- When disposing the equipment, remove the batteries, separate the case, circuit boards, and cables, and dispose of all components in accordance with local waste disposal rules.

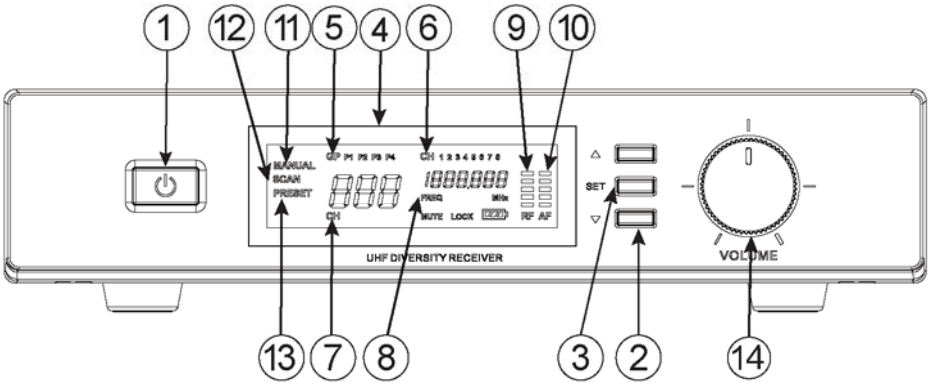
4. Wireless Note

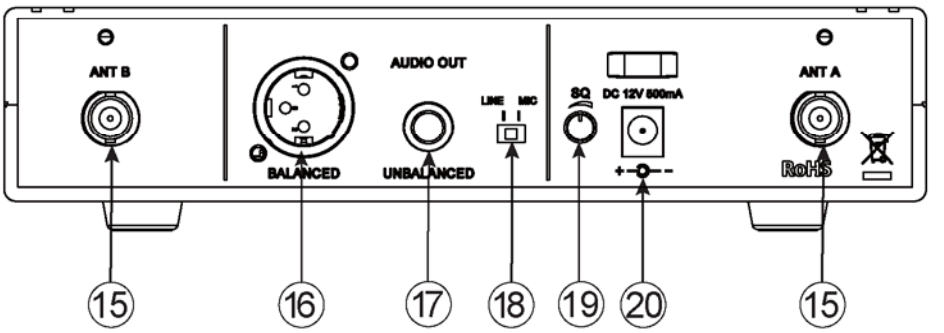
- Before use, make sure that the transmitter and receiver are tuned to the same frequency. Do not use two or more transmitters operating in the same frequency.
- Use good quality batteries to avoid the potential damage resulting from a defective or leaking battery.
- Turn the volume control on the receiver to adjust receiver output level to match input level requirements of an audio mixer or amplifier.
- Use the gain control to adjust the sensitivity of the transmitter's audio to the level of the connected lapel microphone or instrument.
- To avoid interference, do not put the receiver too near metal object and avoid obstructions between transmitter and receiver.
- While checking sound, move the transmitter around the area where you use the system to look for dead spots. If you find a dead spot, change the receiver position. If that does not work, change the receiver location.
- When possible, avoid the interference from TV, radio, other wireless appliances and etc.

5. Product Description

5.1 MUHF101 Receiver

These receivers are used with our 700 selectable-channels transmitters. (The number of frequency channels depends on local regulations.) The receiver operates in the UHF band frequency with PLL synthesized control and is powered by 12V DC.

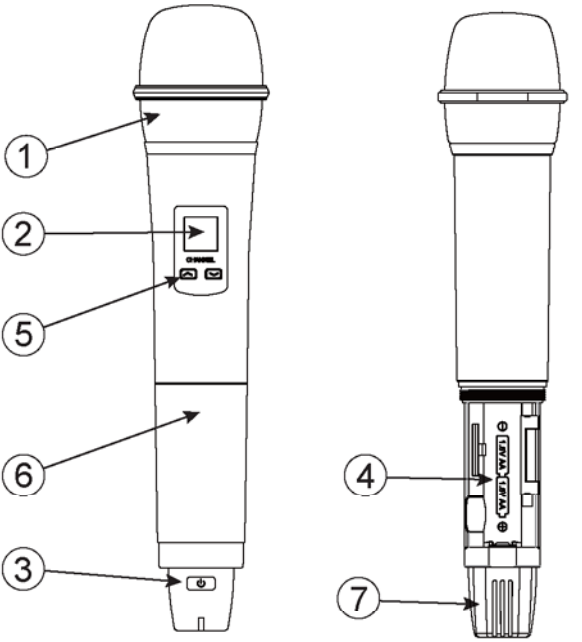




1. **Power:** Press for 4 seconds to power the receiver on or off.
2. **Button △▽:** Used to select your desired mode, and search channel forward.
3. **Set Button:** Press for 2 seconds, until "MUTE" is displayed. Release the button and the LCD display should be flashing. Press button △▽ to change the channel. Stop pressing the buttons and let the LCD display flash five times to lock the setting.
4. **LCD Display:** Displays the channel number, frequency level, RF & AF signal strength, and set-up mode.
5. **GP:** Indicates the preset group number, ex. P1 or P2...
6. **CH:** Indicates the preset channel number, ex CH1 or CH2...
7. **CH:** Indicates the channel number, ex 001 or 128...
8. **FREQ:** Indicates the frequency.
9. **RF Level Indicators:** 5-segment meter glows to dicate audio signal strength. The more segment glowing, the stronger the received signal. If none of these segments glow, no signal is being received.
10. **AF Level Indicators:** 5-segment meter glows to indicate audio signal strength. The more segment glowing, the stronger the input signal. If none of these segments glow, no signal is being input.
11. **MANUAL:** Use this mode to select an interference-free channel manually.
12. **SCAN:** Use this mode to select an interference-free channel automatically.
13. **PRESET:** Use this mode to select an interference-free channel from preset-groups. There are 4 preset groups. In each group there are sited 8 preset channels which are suitable for 8 transmitters simultaneously.
14. **Volume Control:** Use this rotary control to adjust the receiver output level to match the input sensitivity of an audio mixer or an amplifier
15. **Detachable Antenna Socket:** This provides connection to the supplied antennas.
16. **Balanced Output:** 3-pin XLR connector provides balanced low-impedance output.
17. **Unbalanced Output:** Unbalanced 6.3mm mono jack audio output for connecting to, e.g., a guitar amplifier.
18. **Mic/Line Switch:** Use this to adjust output (XLR balanced connector and 6.3 φ unbalanced phone jack) for microphone (-22dBm) or line-level (0dBm).
19. **Squelch:** Use the squelch to adjust the output level to suppress noise. The higher the squelch is set, the lower the sensitivity of the receiver and the smaller the service area of the system. Set the squelch to minimum before turning the receiver on.
20. **DC IN:** DC Input connector for the supplied AC adapter.

5.2 MUHFHH Handheld Microphone

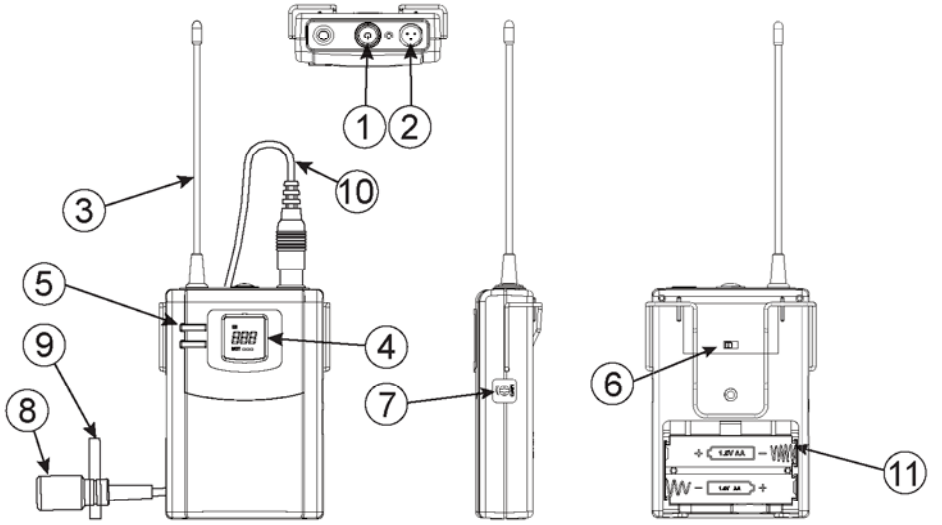
These handheld microphones operate in the UHF band frequency with PLL synthesized control. Up to 700 preprogrammed selectable frequencies are available to avoid interference. (The number of frequency channels depends on local regulations.) These microphones accept any two 1.5V x 2 AA batteries but we suggest using dry or rechargeable batteries for cost-saving and environmental protection.



1. **Grille:** Protects the microphone capsule and helps reduce breath sounds and wind noise.
2. **LCD Display:** Displays channel number and battery power level.
3. **Power:** Press for 4 seconds to power the transmitter on or off.
4. **Battery Compartment:** Insert two AA batteries into the compartment and make sure that the polarity of batteries is correct.
5. **Channel △or ▽ Button:** Press power button for 1 second to let the LCD display flash. Press channel △ or ▽ button to change channel forward or backwards.
6. **Battery Cover:** Unscrew to expose battery compartment and SYNC function button.
7. **Antenna:** Permanently connected, helical antenna.

5.3 MUHFLP Bodypack Transmitter

These bodypack transmitters operate in the UHF band frequency with PLL synthesized control. Up to 700 preprogrammed selectable frequencies are available to avoid interference. These transmitters accept any two 1.5V AA batteries but we suggest using dry or rechargeable batteries for cost-savings and environmental protection.

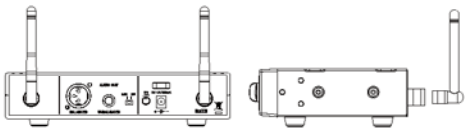


1. **Power:** Press for 4 seconds to power the transmitter on or off.
2. **Mini XLR Connector:** The included electret lapel microphone is inserted into the connector on transmitter.
3. **Antenna:** Permanently connected, helical antenna.
4. **LCD Display:** Displays channel number and battery power level.
5. **Channel △or ▽ Button:** Press power button for 1 second to let LCD display flashing. Press channel △ or ▽ button to change channel forward or backward.
6. **Mic/Line Selector:** The switch sets the audio input either to microphone level or line level.
7. **Gain:** The rotary control adjusts the input audio level of the transmitter. The gain adjustment range is 10dB.
8. **Mic Unit:** The uni-directional electret condenser unit features a wide frequency response for warm, rich bass and clear sound.
9. **Tie Clip:** To clip on a tie or lapel for hands-free operation.
10. **Cable:** With mini XLR connector cable to connect to the transmitter.
11. **Battery Compartment:** Insert two AA batteries into the compartment and make sure that the polarity of the batteries is correct.

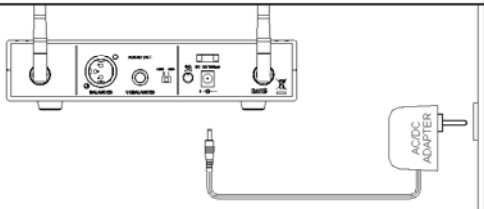
6. SetUp

6.1 Connecting the Receiver

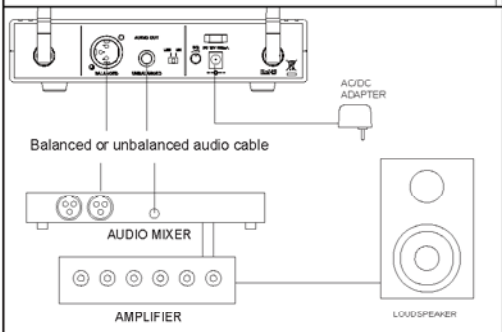
NOTICE: Prior to setup, please check that the transmitter and receiver are tuned to the same frequency. Two or more transmitters operating in the same frequency can not be used at the same time and area. So for each extra transmitter, please select a different frequency to be used simultaneously in a local area.



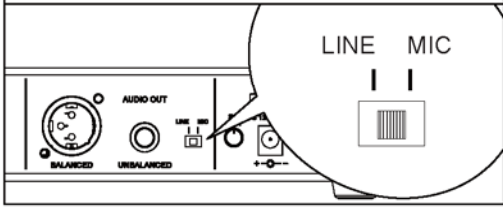
- Plug the antennas into the BNC socket on the receiver and point them upwards.



- Plug the DC 12V 500mA power supply into the power connector on the back of the receiver.



- Connect the receiver output to an audio mixer or amplifier input, using a standard audio cable with 3-pin XLR connectors or 6.3φ phone plugs. Never use the balanced and unbalanced audio outputs at the same time! This may cause signal loss or increased noise.



- Match the Mic / Line selector position of receiver with the audio mixer before connecting with mixer.
  For Mic (-20dBm)
  For Line (0dBm)

➢ When using a standard audio cable (with 3-pin XLR connectors or 6.3 φ phone plugs) to plug into the MIC IN on an audio mixer or amplifier, please turn the Volume Level Control of the receiver to the 1 o'clock position. The output level for balanced and unbalanced output is about at 77mV.

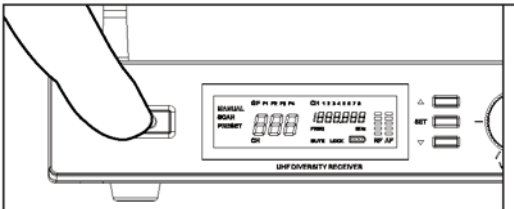
➢ When using a standard audio cable (with 3-pin XLR connectors or 6.3 φ phone plugs) to plug into the LINE IN on an audio mixer or amplifier, please turn the Volume Level Control of the receiver to the MAX. position. The output level for balanced and unbalanced output is about at 770mV. Never use the balanced and unbalanced audio outputs at the same time! This may cause signal loss or increased noise or interference.

6.2 Setup channels on receiver

Notice: Do not operate two or more transmitters in close proximity when setting up the frequency channel. Please keep your transmitter at least one meter away from receiver.

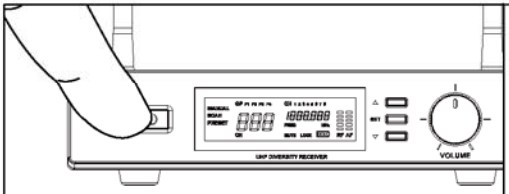
6.2.1 Manual Mode

Setting interference-free channel manually.

	• Press for 4 seconds to turn on the receiver.
	• Using the △ button to select the "MANUAL" mode.
	• Press the "SET" button for 2 seconds until "MUTE" appears and the LCD display is flashing, then release the button.
	• Press button △ to change the channel forward.
	• Press the "SET" button to lock the setting or let LCD display flash five times.

6.2.2 Auto-Scan Mode

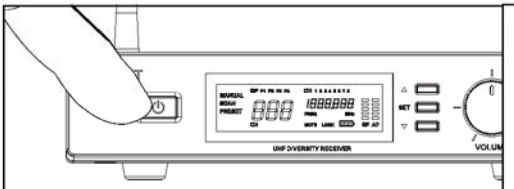
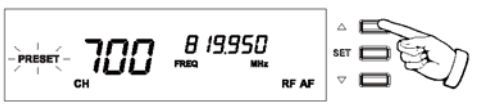
Setting interference-free channels by auto-scan programmed search.

	• Press for 4 seconds to turn on the receiver.
	• Using the △ button to select "SCAN" mode.
	• Press the "SET" button for 2 seconds until "MUTE" appears and the LCD display is flashing, then release the button.
	• Press button △ to scan and the unit will stop at an interference-free channel automatically.
	• Press the "SET" button to lock the setting or let LCD display flash five times.

NOTE: If you need to set up a multi-receiver system, please keep your previous receiver/microphone pair powered on. Then repeat the scanning procedure with the next system.

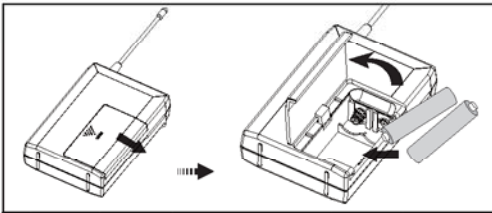
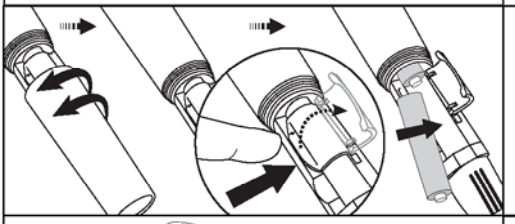
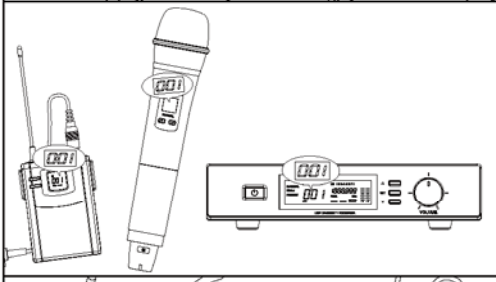
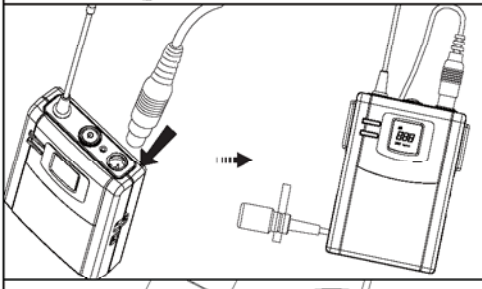
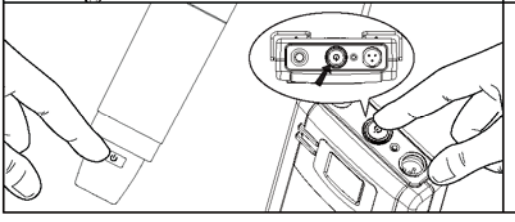
6.2.3 Preset Mode

There are 4 preset groups. In each group, there are 8 preprogrammed channels. Using a preset group, a user can easily set up an 8 receiver / microphone system according the default setting channels of a preset group. Excluding outside interference, the default setting channels are interference-free. Users do not need to worry about how to scan 8 channels for a multi-receiver system. Users can use a preset group to set up in just a few steps.

	• Press for 4 seconds to turn on the receiver.
	• Using the △ button to select the "PRESET" mode.
	• Press "SET" button for 2 seconds until "MUTE" appears and the LCD display is flashing, then release the button.
	• Press channel button △ to change the programmable **group forward.**
	• Press "SET" button again to lock the group setting or let the LCD display flash five times.
	• Press channel button △ to change the programmable **channel forward.**
	• Press the set button to lock the channel setting or let the LCD display flash five times.

NOTE: When there is any outside interference on the current preset group, please switch to the next preset group. If 4 preset groups all experience interference, please use auto-scan mode or manual mode to set up the system.

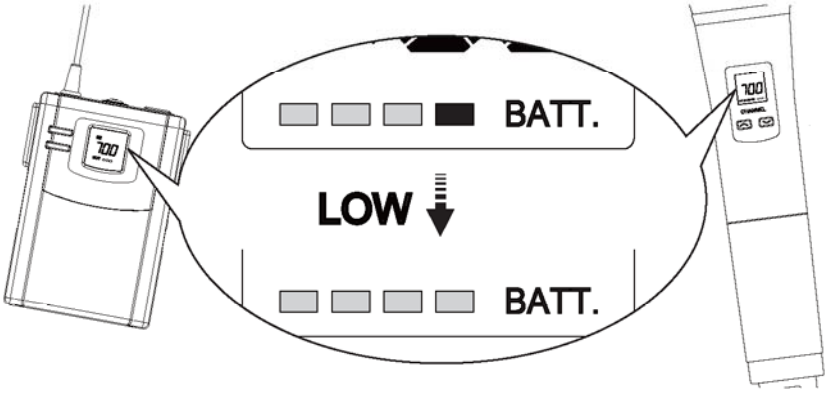
6.3 Setting up the handheld microphone / Bodypack transmitter

	• Open the battery cover and insert batteries into the battery compartment, conforming to the polarity (+)(-) marks. The transmitter can not work with incorrectly inserted batteries.
	• Unscrew the handheld Mic and press to open the battery cover to insert the battery into the battery compartment and confirm the polarity (+) (-). The transmitter works with correctly inserted batteries.
	• Press the “SET” button on the receiver to auto-scan the channel and let the LED display flash to automatically lock the channel . • Use the adjust pin to set the channel of the transmitters as same as the receiver.
	• Plug the mini XLR connector of the microphone cable into the audio input connector on the bodypack transmitter.
	• Press the power button for 4 seconds to turn the Handheld/ Bodypack transmitter on.

Note : When you don’t use this device for a long term period, please switch the power to “off” mode to prolong battery life.

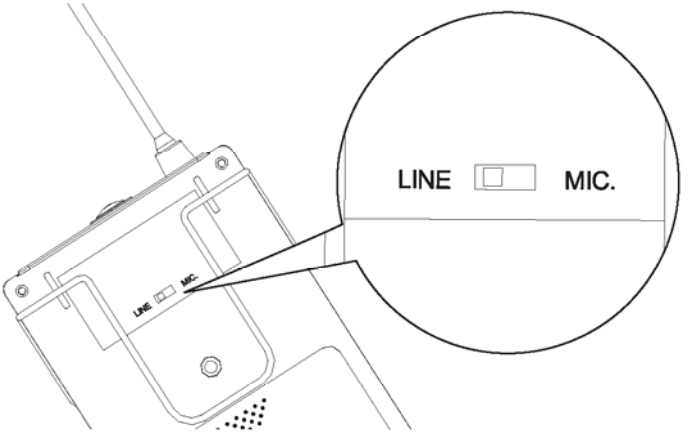
6.4 Low Battery

When the LCD display shows the low battery power level , it indicates that the battery will be out of power soon and should be changed.



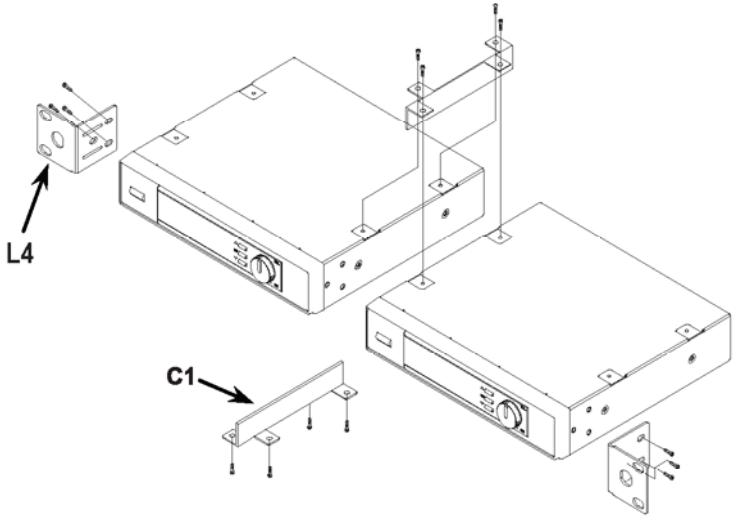
6.5 Adjusting Gain

Use the MIC/LINE switch to adjust the input level. Switch the selector to the Mic position when connecting with a microphone for a normal audio input level. Switch the selector to the Line position when connecting with an instrument for a high audio input level.

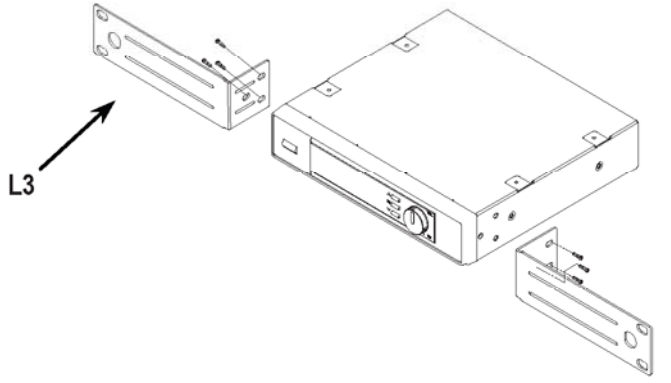


7. Basic Connections

To combine two receivers in a 19" standard rack, use 2 short L type plastics racks (L4) and 2 metal connecting plates (C1). (Each system includes a L4 and a C1.)



Mount a receiver in a 19" standard rack by using 2 L type long metal racks (L3).
(L3 is an optional product.)



8. Trouble-shooting

Problem	Solution
No sound	➢ Check the power supply of the microphone and receiver. ➢ Check that the transmitter and receiver are tuned to the same frequency. ➢ Check whether the hi-fi appliance is switched on and the receiver output is connected to audio mixer or amplifier input. ➢ Check whether transmitter is too far away from receiver or SQUELCH control set too high. ➢ Check whether receiver is located too near metal object or there are obstructions between transmitter and receiver.
Sound interference	➢ Check the antenna location. ➢ When using 2 or more microphone sets simultaneously, make sure that the chosen frequencies do not conflict. ➢ Check whether the interference comes from other wireless microphones, TV, radio and etc.
Distortion	➢ Check if the receiver volume level is set too high or too low. ➢ Check whether the interference comes from other wireless microphones, TV, radio and etc.

9. System Feature

- ➢ The flexibility and the professional performance of these Speco Technologies wireless systems are specifically designed for stages, houses of worship, and professional sound installations.
- ➢ The UHF wireless microphone system with 700 selectable frequencies via Phase Locked Loop (PLL) circuitry makes it easy to choose interference-free channels.
- ➢ Auto-Scan technology for easy-operation and fast channel set-up.
- ➢ Super high sensitivity, extremely low noise transmission and reception.
- ➢ SMT assembled PCB module ensures the quality and stability.

10. System Specification

Receiver

- Carrier Frequency Range : UHF 540 - 570MHz
- Case : Half 19" EIA-Rack Case
- Oscillator : PLL Synthesized
- Modulation : FM
- Frequency Stability : ±0.005%
- S/N ratio : ＞94dB, at 20KHz deviation and 60dBμV antenna input
- Image and Spurious Rejection : 80 dB minimum
- Receiving Sensitivity : At 10 uV over 80dB S/N ratio
- Selectivity : ＞50dB
- AF Response : 80Hz to 16KHz
- T.H.D. : ＜1% (at 1KHz)
- IF Frequency : 1st: 243.95MHz 2nd:10.7MHz
- Dynamic Range : ＞100dB
- Tone Signal : 32.768KHz
- Audio Output : Balanced & Unbalanced
- Power Supply : DC 12V
- Current Consumption : 260mA (MAX)
- Dimension (mm)WxHxD : 200 x 42 x 123

Handheld/Bodypack Transmitter

- **Frequency Range** : UHF 540 - 570MHz
- Channel Select : ▲▼Tag Switch
- **RF Power Output** : **10mW (max.)**
- **Oscillator** : **PLL Synthesized**
- **Frequency Stability** : **±0.005%**
- **Deviation** : **±20KHz with limiting compressor**
- **Spurious Emission** : **＞60dB below carrier frequency**
- **T.H.D.** : **＜1% (at 1KHz)**
- Battery : 1. DC 2.4V (1.2V x 2 AA size rechargeable batteries)
  2. DC 3V (1.5V x 2 AA size batteries)
- Tone Key : 32.768KHz
- Mic Unit : Handheld : Uni-directional dynamic unit
  Uni-directional electret condenser unit (ECM-1441)
  Bodypack :Lavalier Mic / Headset Mic
- Display : LCD
- Current Consumption : 120mA ± 10mA (MAX)
- Dimension (mm)WxHxD : Handheld : 248 x 53Φ
  Bodypack :65 x 100 x 27

* Specifications are subject to change without notice.