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Walfront TB21

ZK-TB21 High Power Amplifier Board User Manual

Model: ZK-TB21 | Brand: Walfront

INTRODUCTION

This manual provides detailed instructions for the proper installation, operation, and maintenance of your Walfront ZK-TB21 High Power Amplifier Board. Please read this manual thoroughly before using the product to ensure safe and optimal performance. Keep this manual for future reference.

SAFETY INFORMATION

Always observe the following safety precautions to prevent electric shock, fire, or damage to the unit.

- **Power Supply:** Use only the specified DC 12-24V/5A or higher power supply. Ensure the power supply is stable and provides sufficient current.
- **Ventilation:** Do not block any ventilation openings. Ensure adequate airflow around the amplifier board to prevent overheating.
- **Moisture:** Do not expose the unit to rain, moisture, or excessive humidity. Avoid placing liquids near the amplifier.
- **Handling:** Handle the board with care to avoid damaging electronic components. Avoid touching exposed circuits when powered.
- **Installation:** Ensure all connections are secure and correct before applying power. Incorrect wiring can cause damage.
- **Repair:** Do not attempt to repair or modify the unit yourself. Refer all servicing to qualified personnel.

PRODUCT OVERVIEW

The ZK-TB21 is a 2.1 channel Bluetooth digital amplifier board designed for high-power audio applications. It features independent volume controls for subwoofer, left/right channels, and master volume, along with treble and bass adjustments.

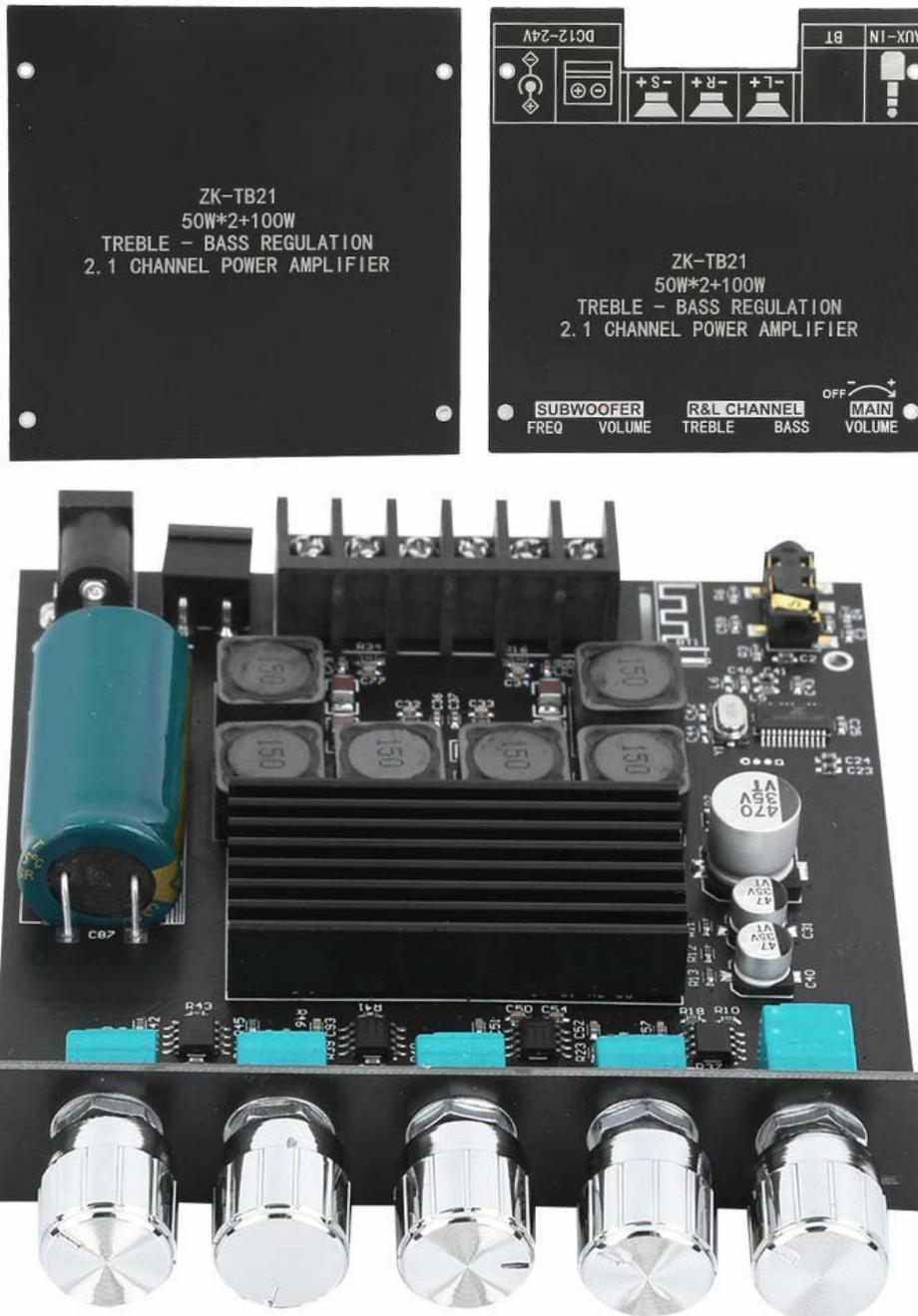


Figure 1: ZK-TB21 Amplifier Board with its top and bottom control plates.

Key Features:

- Bluetooth 5.0 connectivity for wireless audio streaming.
- AUX input for wired audio sources.
- 2.1 channel output: two main channels (left/right) and one subwoofer channel.
- Independent volume, treble, and bass controls.
- Built-in protection mechanisms: overvoltage, undervoltage, overheating, DC detection, short circuit protection.

Component Identification:

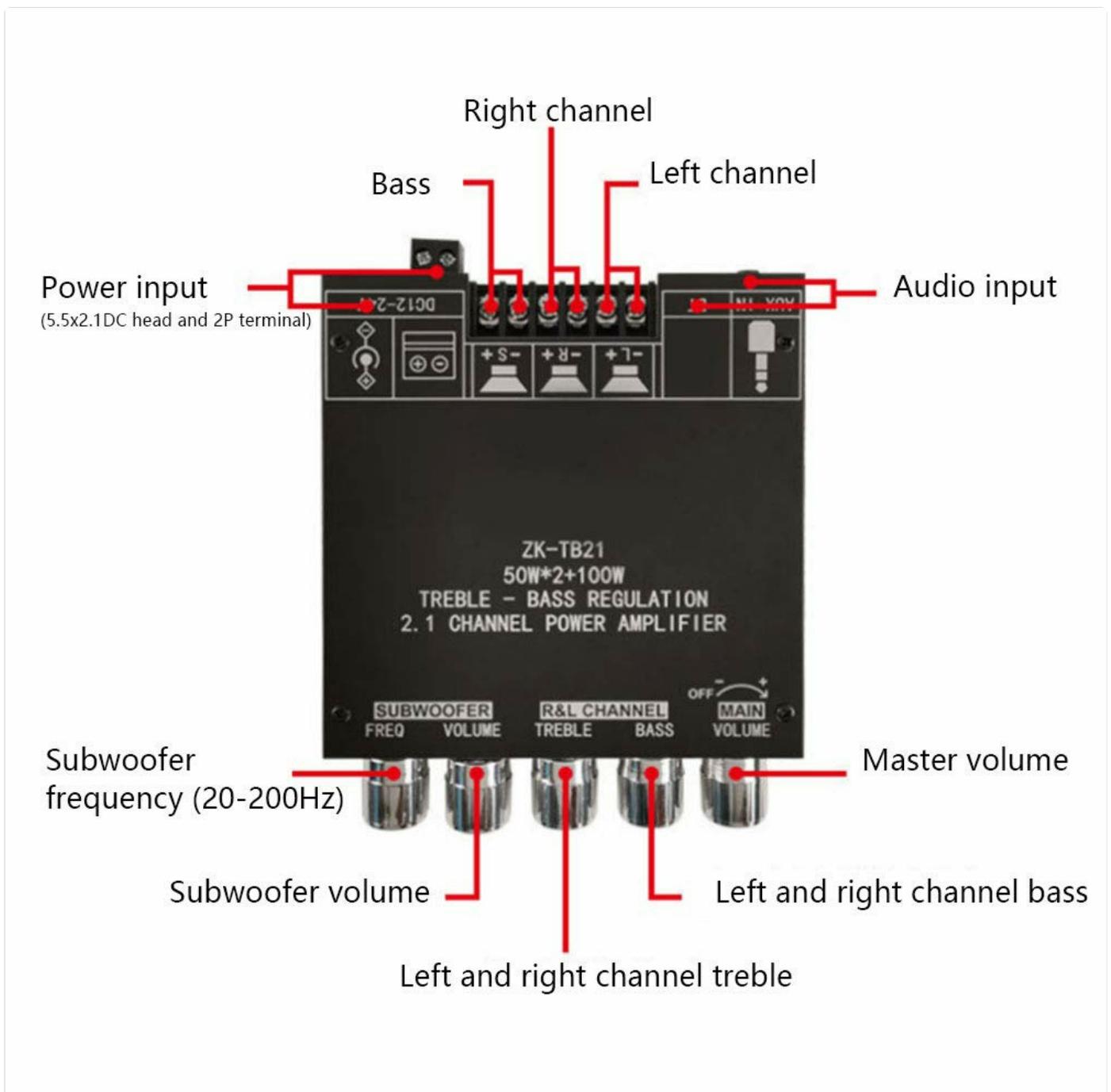


Figure 2: Detailed view of the ZK-TB21 Amplifier Board showing power input, audio input, channel outputs, and control knobs.

Power Input: DC 12-24V (5.5x2.1DC head and 2P terminal)

Audio Input: AUX + Bluetooth

Right Channel Output: Speaker connection for right channel.

Left Channel Output: Speaker connection for left channel.

Subwoofer Output: Speaker connection for subwoofer.

Subwoofer Freq: Adjusts subwoofer crossover frequency (20-200Hz).

Subwoofer Volume: Controls subwoofer output level.

Left and Right Channel Treble: Adjusts high frequencies for main channels.

Left and Right Channel Bass: Adjusts low frequencies for main channels.

Master Volume: Overall volume control for all channels.

| Feature | Description |
|----------------------|--|
| Adapter Power Supply | DC 12-24V/5A or more (higher voltage = higher output power) |
| Adapted Speakers | 20-100W, 4-8Ω |
| Output Power | 50W*2 (Left/Right Channels) + 100W (Subwoofer) |
| Protection Mechanism | Overvoltage, Undervoltage, Overheating, DC Detection, Short Circuit Protection |
| Mounting Type | Surface Mount |

SETUP

Follow these steps to set up your ZK-TB21 amplifier board:

- 1. Prepare Components:** Ensure you have the amplifier board, a suitable DC 12-24V/5A or higher power supply, and your 2.1 channel speakers (two main speakers and one subwoofer).
- 2. Connect Speakers:**
 - Connect your left main speaker to the "Left Channel" output terminals.
 - Connect your right main speaker to the "Right Channel" output terminals.
 - Connect your subwoofer to the "Subwoofer" output terminals.
 - Ensure correct polarity (+ to + and - to -) for all speaker connections.

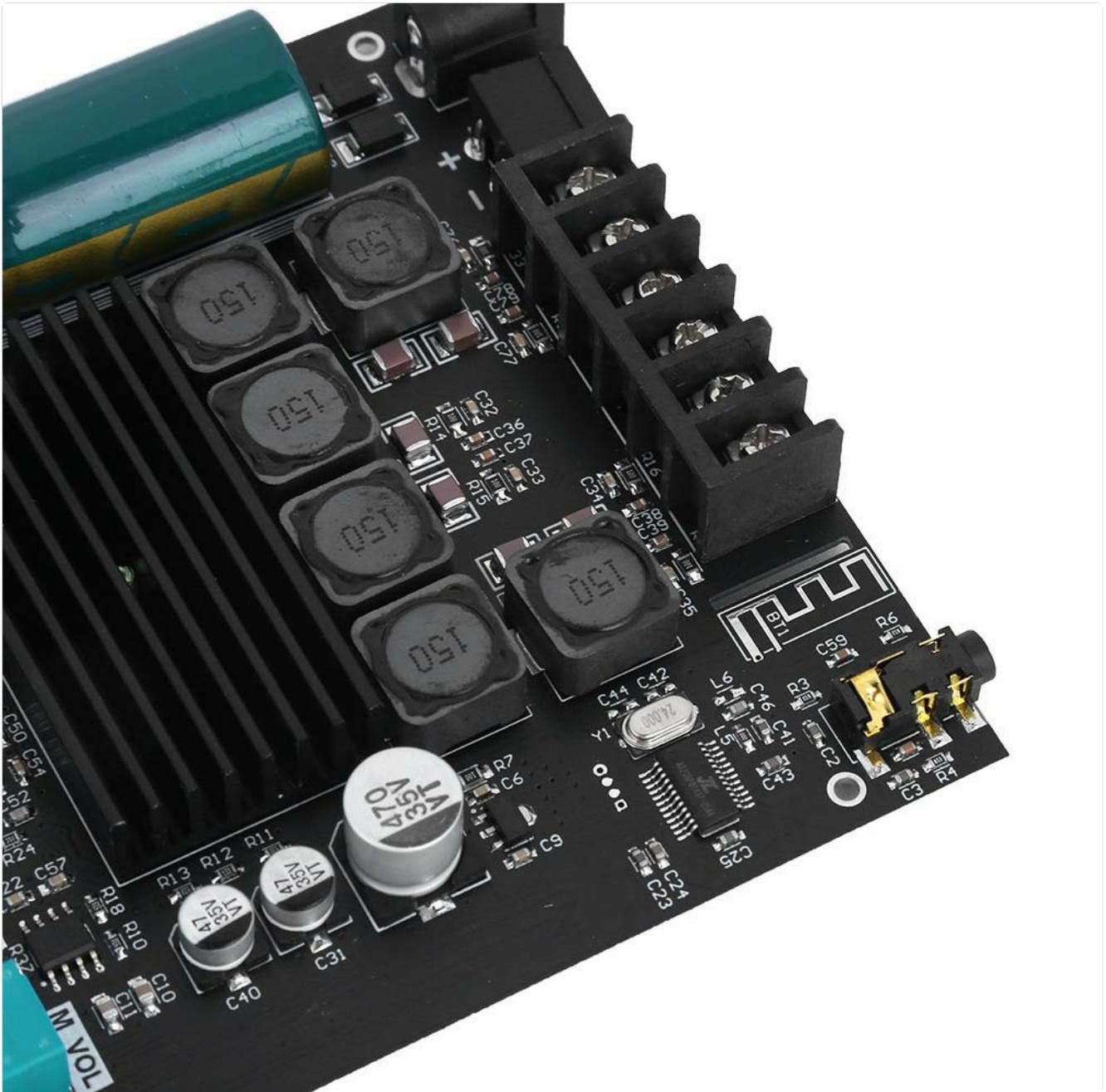


Figure 4: Close-up view of the speaker and power connection terminals.

3. Connect Audio Input:

- **AUX Input:** If using a wired audio source (e.g., smartphone, PC), connect it to the AUX input jack using a 3.5mm audio cable.
- **Bluetooth Input:** For wireless connection, proceed to the "Operating" section for Bluetooth pairing instructions.

4. **Connect Power Supply:** Connect your DC 12-24V power supply to the power input terminals (DC 12-24V) on the board. Ensure the power supply is off or unplugged before connecting.

5. **Initial Check:** Double-check all connections before powering on the board. Ensure no wires are loose or short-circuiting.

OPERATING INSTRUCTIONS

Once the amplifier board is set up, you can begin operation.

Power On/Off:

Connect the power supply to turn on the board. Disconnect the power supply to turn it off. Note: The Bluetooth connection may remain active even when the board is "off" if power is still supplied, requiring disconnection from the power source for full shutdown.

Bluetooth Pairing:

1. Ensure the amplifier board is powered on.
2. On your Bluetooth device (e.g., smartphone, tablet), enable Bluetooth and search for available devices.
3. Select "ZK-TB21" from the list of found devices to pair.
4. Once paired, audio from your device will be streamed to the amplifier.

Adjusting Audio:



Figure 5: Close-up view of the five control knobs for audio adjustment.

- **Master Volume:** Use the far-right knob to control the overall output volume.

- **Subwoofer Volume:** Adjust the dedicated subwoofer volume knob to set the bass level.
- **Subwoofer Frequency (FREQ):** Use this knob to set the crossover frequency for the subwoofer, typically between 20-200Hz.
- **Treble (R&L Channel):** Adjust the treble knob for the main left and right channels to control high frequencies.
- **Bass (R&L Channel):** Adjust the bass knob for the main left and right channels to control low frequencies.

Note: For optimal sound, start with all volume knobs at a low setting and gradually increase them. Avoid setting the master volume too high, especially if distortion occurs, as this can damage speakers or the amplifier.

MAINTENANCE

Proper care and maintenance will extend the life of your amplifier board.

- **Cleaning:** Disconnect power before cleaning. Use a soft, dry cloth to wipe the surface of the board. Do not use liquid cleaners or solvents.
- **Dust:** Regularly remove dust from the heatsink and components using compressed air or a soft brush to ensure proper cooling.
- **Environment:** Store and operate the board in a clean, dry environment, away from direct sunlight, extreme temperatures, and corrosive substances.
- **Connections:** Periodically check all wire connections to ensure they are secure and free from corrosion.

TROUBLESHOOTING

If you encounter issues with your ZK-TB21 amplifier board, refer to the following common problems and solutions:

| Problem | Possible Cause | Solution |
|-----------------------------|--|---|
| No sound output | <ul style="list-style-type: none"> ◦ No power or incorrect power supply. ◦ Incorrect speaker wiring. ◦ Input source not connected or volume too low. ◦ Bluetooth not paired or AUX cable faulty. | <ul style="list-style-type: none"> ◦ Verify power supply (12-24V/5A+). ◦ Check speaker connections and polarity. ◦ Ensure input device is playing and its volume is up. ◦ Re-pair Bluetooth or try a different AUX cable. |
| Distorted sound | <ul style="list-style-type: none"> ◦ Volume too high (amplifier or input source). ◦ Incompatible speakers (impedance/power). ◦ Poor power supply (insufficient current). ◦ Loose connections. | <ul style="list-style-type: none"> ◦ Reduce volume levels. ◦ Ensure speakers are 4-8Ω and 20-100W. ◦ Use a power supply with sufficient current (5A or more). ◦ Check all wiring for secure connections. |
| Bluetooth connection issues | <ul style="list-style-type: none"> ◦ Device too far from amplifier. ◦ Interference from other devices. ◦ Bluetooth not enabled on device. | <ul style="list-style-type: none"> ◦ Move device closer to the amplifier (within 10m). ◦ Turn off other Bluetooth devices nearby. ◦ Ensure Bluetooth is active and re-pair. |

| Problem | Possible Cause | Solution |
|-------------|--|--|
| Overheating | <ul style="list-style-type: none">◦ Insufficient ventilation.◦ Operating at maximum power for extended periods. | <ul style="list-style-type: none">◦ Ensure adequate airflow around the heatsink.◦ Reduce volume or allow the unit to cool down. |

WARRANTY AND SUPPORT

Walfront products are designed for reliability and performance. For specific warranty terms and conditions, please refer to the documentation provided with your purchase or contact Walfront customer support.

If you require technical assistance or have questions not covered in this manual, please contact Walfront customer service through their official channels or the retailer from whom you purchased the product.

For more information, visit the [Walfront Store on Amazon](#).