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› DONGKER Ultrasonic Levitator Soldering Kit 12V DC Instruction Manual

DONGKER GY20962ABHIC

DONGKER Ultrasonic Levitator Soldering Kit 12V DC Instruction Manual

Model: GY20962ABHIC

1. PRODUCT OVERVIEW

The DONGKER Ultrasonic Levitator Soldering Kit is an educational DIY project designed for enthusiasts to learn about electronics, soldering, and the principles of ultrasonic wave technology. This kit allows you to assemble a device that can levitate small, light objects using ultrasonic waves.

The assembled project operates at a frequency of 40 kHz in the air and is capable of levitating light objects with a density of 2-3 mm, such as small sponge balls. It provides a hands-on experience to understand how acoustic forces can overcome gravity.

What's in the Box:

The kit includes all necessary electronic components and mechanical parts for assembly. Please refer to the component list provided in the kit packaging to verify all parts are present before beginning assembly.

Assembly of this kit requires basic soldering skills. The circuit is designed to be straightforward, but attention to detail is crucial, especially for SMD components. A 12V DC power adapter is required and not included in the kit.

Assembly Steps:

- 1. Component Identification:** Before soldering, carefully identify all components using the provided component list and circuit diagram. Ensure all parts are present and undamaged.
- 2. Solder SMD Components:** Begin by soldering the smaller Surface Mount Device (SMD) components onto the PCB (Printed Circuit Board). These require precision and a fine-tipped soldering iron.
- 3. Solder Through-Hole Components:** Proceed with soldering the larger through-hole components, such as resistors, capacitors, LEDs, and the DC power jack.
- 4. Attach Ultrasonic Probes:** Solder the two ultrasonic probes (transducers) to their designated positions on the PCB. Ensure correct orientation as indicated in the circuit diagram.
- 5. Assemble Mechanical Structure:** Mount the PCB onto the base using the provided standoffs and screws. Attach the support pillars and the upper frame, ensuring the top ultrasonic probe is securely positioned directly above the bottom one. Precise alignment is critical for optimal performance.
- 6. Final Inspection:** After all soldering and assembly are complete, visually inspect all solder joints for bridges or cold joints. Verify that all components are correctly oriented and securely attached.

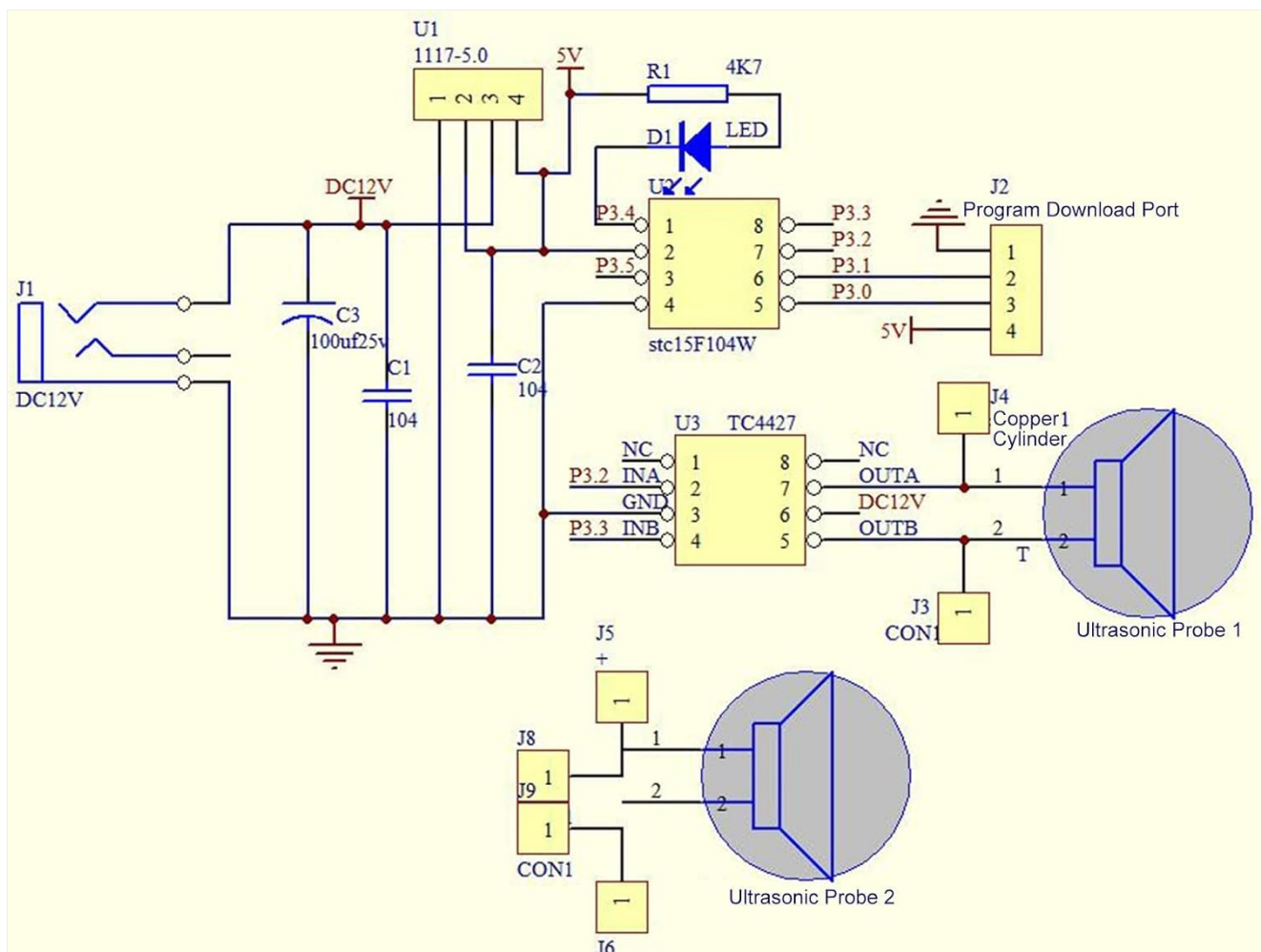


Image 3.1: Circuit diagram for the DONGKER Ultrasonic Levitator.



Image 3.2: Fully assembled DONGKER Ultrasonic Levitator.

4. OPERATING INSTRUCTIONS

Once assembled, the ultrasonic levitator is ready for operation. Ensure you have a stable 12V DC power source.

Operating Principle:

The device works by generating a standing ultrasonic wave between the two transducers. When a small, light object is placed at a node (a point of minimal displacement) within this standing wave, the acoustic radiation pressure exerted by the ultrasonic waves can counteract gravity, causing the object to levitate.

Steps for Operation:

1. **Connect Power:** Connect a 12V DC power adapter to the DC power jack on the assembled kit. The LED indicator should light up, indicating power is supplied.
2. **Prepare Object:** Select a small, light object for levitation, such as a sponge ball (2-3 mm in diameter).
3. **Position Object:** Carefully place the object between the two ultrasonic probes. You may need to gently guide it into the standing wave's node.
4. **Observe Levitation:** The object should begin to levitate and hover in mid-air. Experiment with different small objects and positions to achieve stable levitation.

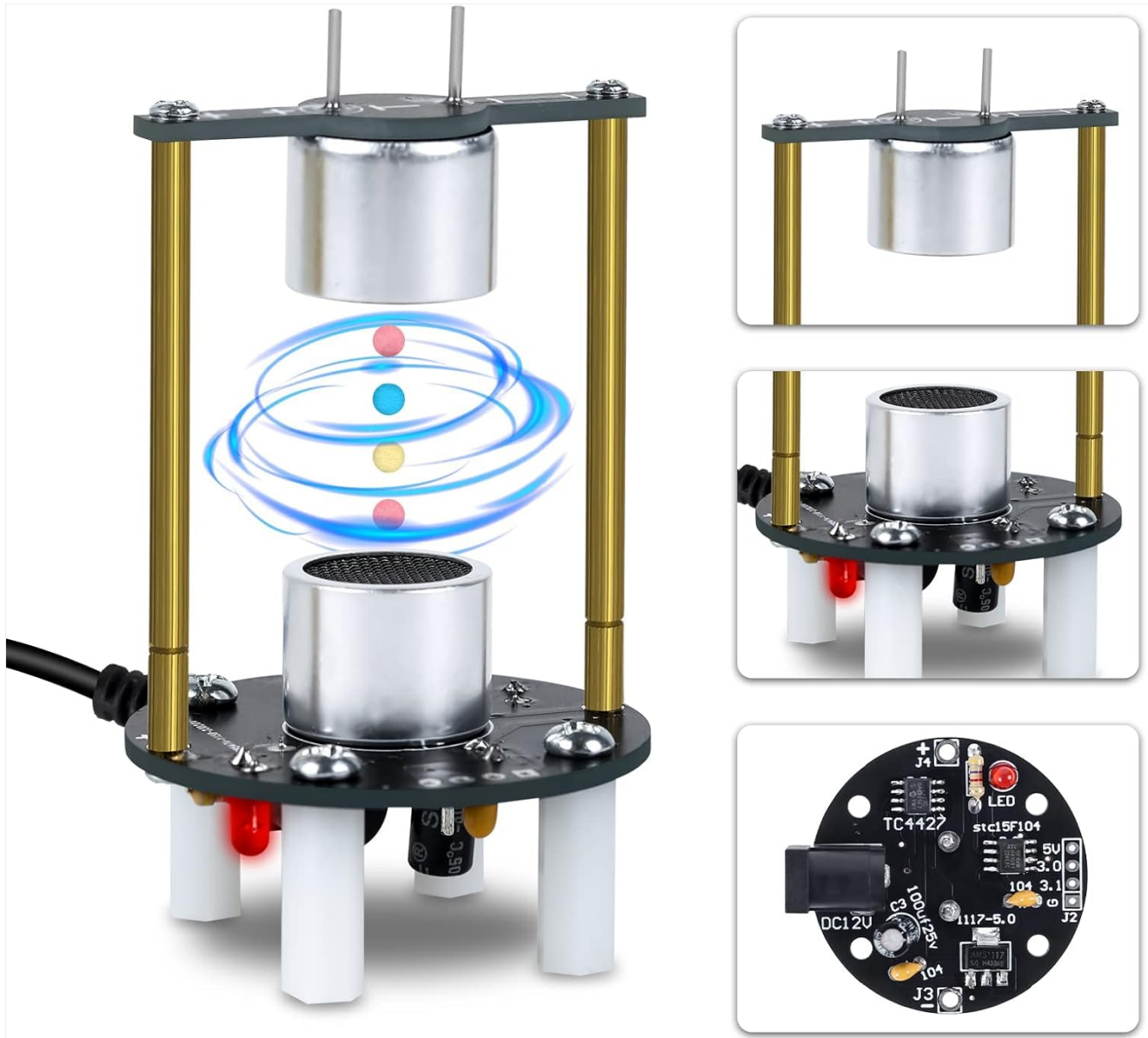


Image 4.1: The DONGKER Ultrasonic Levitator actively levitating small objects.

5. MAINTENANCE

The DONGKER Ultrasonic Levitator Soldering Kit requires minimal maintenance to ensure longevity and proper function.

- **Cleaning:** Keep the device clean and free from dust. Use a soft, dry cloth to wipe surfaces. Avoid using liquids or abrasive cleaners.
- **Storage:** Store the kit in a dry, cool place away from direct sunlight and extreme temperatures.
- **Component Check:** Periodically inspect solder joints and components for any signs of damage or loose

connections. Re-solder if necessary.

- **Avoid Impact:** Do not drop or subject the device to strong impacts, as this can damage the delicate electronic components or misalign the ultrasonic probes.

6. TROUBLESHOOTING

If you encounter issues with your DONGKER Ultrasonic Levitator, refer to the following troubleshooting guide:

Problem	Possible Cause	Solution
Device does not power on (LED off)	No power, faulty power adapter, incorrect wiring, short circuit.	Check 12V DC power adapter connection. Verify power outlet. Inspect power input wiring and solder joints for shorts or breaks.
Object does not levitate	Incorrect object size/weight, misaligned transducers, faulty transducers, incorrect frequency, cold solder joints.	Ensure object is small and light (e.g., 2-3mm sponge ball). Verify transducers are perfectly aligned. Check solder joints on transducers and main circuit. Ensure all components are correctly installed.
Unstable levitation	Air currents, vibrations, slight transducer misalignment.	Operate in a still environment. Place on a stable surface. Re-check transducer alignment.
Components overheating	Short circuit, incorrect component value, excessive voltage.	Immediately disconnect power. Re-check all wiring and component placement against the circuit diagram. Ensure 12V DC power supply is correct.

7. SPECIFICATIONS

Feature	Detail
Brand	DONGKER
Model Number	GY20962ABHIC
Educational Objective	Learning electronics, soldering skills, physics (ultrasonic wave technology)
Power Source	12V DC Power Adapter (User-provided)
Operating Frequency	40 kHz
Levitation Capacity	Light objects, approx. 2-3 mm density (e.g., sponge balls)
Assembly Required	Yes
Material	Polyvinyl Chloride (PVC)
Item Dimensions (L x W x H)	10 x 7 x 2 cm (approximate assembled size)
Age Range	Adult (Minimum recommended age 108 months / 9 years with supervision)

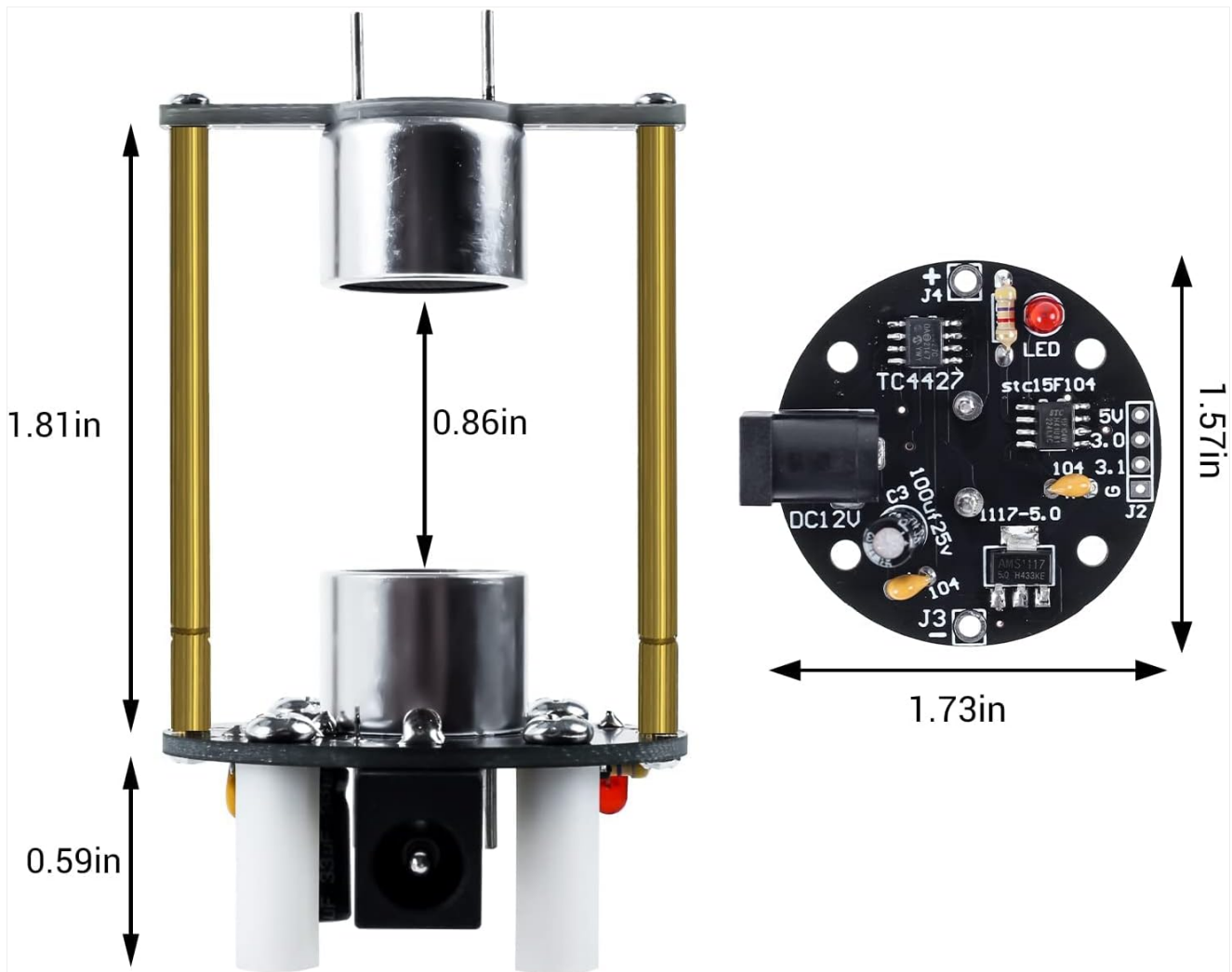


Image 7.1: Approximate dimensions of the DONGKER Ultrasonic Levitator.

8. WARRANTY AND SUPPORT

Information regarding specific warranty terms or direct support contacts is not provided with this kit. For any issues or inquiries, please refer to the retailer or platform where the product was purchased. Detailed instructions and a PDF version of the user manual may be available on the product page of the retailer.