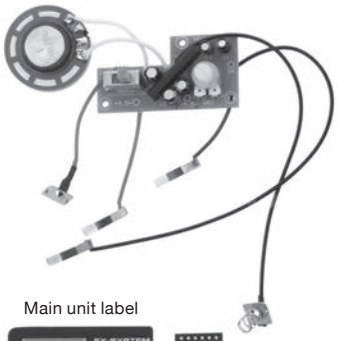
How to assemble the Electric Block mini

Assembly time	Approx. 20 minutes

Parts in the Kit

Circuit board (with speaker)



Main unit label

Speaker label

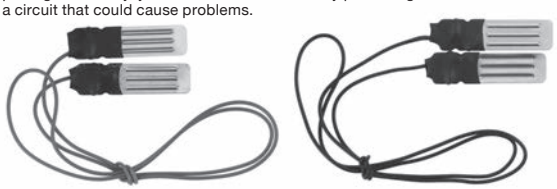
Microphone cover

Earphone

Main case and blocks

* If you insert the blocks as shown in the picture when putting them away, you can avoid unintentionally producing a circuit that could cause problems.

Lead wires (qty. 2, red and black)



Speaker cover

Volume knob

Battery contacts (qty. 2)

Washer head screws (qty. 2)

Screws (qty. 3)

Things you will need

・Phillips screwdriver (No. 1)
・AAA batteries (qty. 3)
* You can use either alkaline batteries or zinc-carbon batteries. Do not use NiCd batteries, nickel metal hydride batteries, or any other rechargeable batteries as the voltage produced is too low, which would result in the supplement failing to operate. Do not use Oxyride batteries, either, as the voltage produced with such batteries is too high and may cause parts to break.
・Pencil
・Toothpick

Notes for tightening screws

When tightening screws, firmly press the screwdriver straight against the screw and turn. It is said that 70 percent of the force applied is used for pushing against the screw and 30 percent for turning it. The types of screws used for the supplement are those that carve grooves into the plastic as they are inserted (self-threading). For this reason, the screw hole may be damaged if you exert too much force when tightening the screw. Since it is difficulty to turn a precision screwdriver, please use a small driver that has a grip radius of about 2 cm.

Full scale image of screwdriver

●Materials used in this kit

Main case, Volume Knob (black), Blocks (green), Microphone cover, Earphone (beige), Speaker cover (green) : ABS
Main unit label, Speaker label : PP
Screws, battery contacts, terminal : Iron

⚠ CAUTION Please be sure to read the following instructions before assembling this kit.

Take necessary caution when handling parts with pointed edges. There is a risk of injury.
Be careful when using the smaller parts so that you do not put them in your mouth and accidentally swallow them. There is a risk of suffocation.

Three AAA batteries are used. Incorrect use of the batteries may cause the generation of heat, explosions or liquid leakage. The following precautions should be taken.

- Do not use rechargeable batteries such as NiCd batteries, or Oxyride batteries
- Ensure that the positive and negative terminals of the batteries are aligned correctly.
- If liquid that leaked from batteries gets into your eyes, rinse it well with plenty of water and consult a doctor immediately. If liquid leaks onto your skin or clothes, immediately wash it off.
- Always remove the batteries after use.
- Do not mix old and new batteries.
- Store the kit in a location out of the reach of small children.

* Please read the instructions and cautions thoroughly before use.
* For your safety, be sure to follow the instructions in this manual. In addition, do not use any parts that have become damaged or deformed during use.

Be sure to thoroughly read the following before attempting any experiments.

● Electronic parts (in particular transistors and diodes) may fail or otherwise breakdown if too much current flows through them. Be extremely careful when handling such parts. Observe the following when using the supplement to prevent excess current from flowing through circuits.
· Be sure that the main switch is turned off before lining up blocks and inserting lead wires, the earphone terminals, and other parts as shown in the relevant Block Layout Diagram. Be sure to go back through and thoroughly check the wiring before turning on the main switch.
· Make sure that the main switch has been turned off before you attempt to insert or remove any blocks. (Also make sure to turn off the main switch after finishing one experiment and before moving on to the next one.)

● Some electronics part blocks can be used in substitution for lead wire blocks. This allows you to use parts blocks that are not included in a given Circuit Schematic. Please be aware of this when working on experiments. (In the Block Layout Diagram, block wires and electronic parts that can be used in substation for lead wire blocks are drawn in lightly to indicate that they are to be used in this manner.)

● When putting together circuits, be sure to check the Block Layout Diagram as you arrange blocks and insert lead wires, the earphone, and other parts. The circuit will not be completed if there are any blocks at all that have been inserted in the wrong place or arranged in the wrong direction. Please make sure to check the diagram and the blocks as you put your circuits together.

● Watch out for part contact problems. If a block is not firmly inserted into the main unit, it may not make proper contact with the contact hardware. If you have any contact problems, push firmly down on each block to make sure that it is inserted and seated correctly.

● There may be instances in which you find that a white powder has formed on the metal parts of the blocks. This may cause contact problems. If it occurs, please wipe away the powder with a cloth or other cleaning wipe.

● For circuits that use the earphone, turn the main switch on before inserting the earphone into your ear. Make sure that the earphone volume is not set too high before inserting the earphone into your ear.

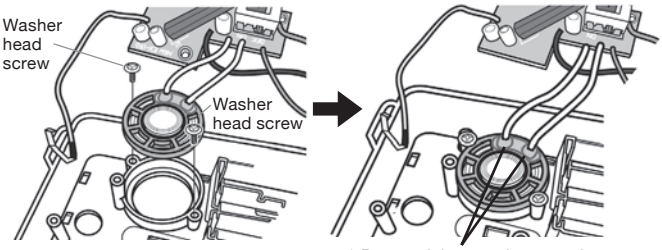
● For circuits that produce a sound output from the speaker, use the volume knob to adjust the speaker volume as necessary. You can turn off or mute the sound by turning the volume knob all the way to the left. Depending on the circuit, sound may still be output from the speaker at low volume in some cases even with the volume knob at the leftmost setting.

Preparations

Remove all blocks from the main case. (Check to make sure that all blocks are present by comparing to the" List of Supplement and Accompanying Parts" on the cover.)

1 Attach the speaker.

Insert the speaker into the hole on the back of the main case, and secure it in place with two washer head screws (make sure that you have the speaker oriented correctly before screwing it down).



* Be careful not to damage the circuit board or lead wires with the screwdriver.

* Be careful not to let any of the speaker contacts or other connections get caught in the screws.

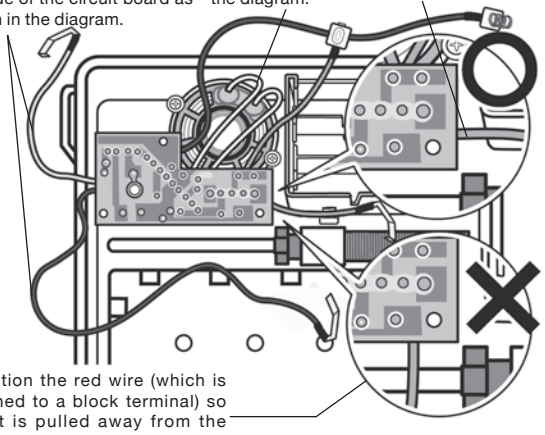
2 Position the lead wires on the circuit board.

Turn the circuit board over as shown in the diagram and position the lead wires as indicated.

* Bend and shape the gray and black wires (which are attached to block terminals) so that they extend out from the side of the circuit board as shown in the diagram.

* Bend the ends of the white wires over so that they loop back as shown in the diagram.

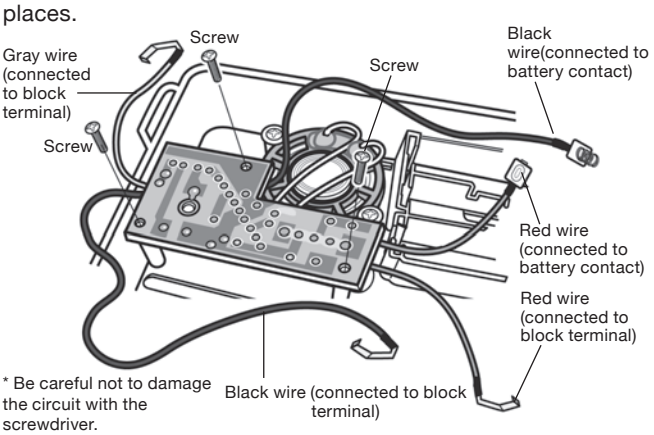
* Do not allow the red wire (which is attached to a block terminal) extend out from the bottom.



* Position the red wire (which is attached to a block terminal) so that it is pulled away from the screw holes and extends out from the side, as shown in the diagram.

3 Secure the circuit board in the main case using screws.

After you have finished positioning the lead wires, secure the circuit board to the main unit case with screws in three places.

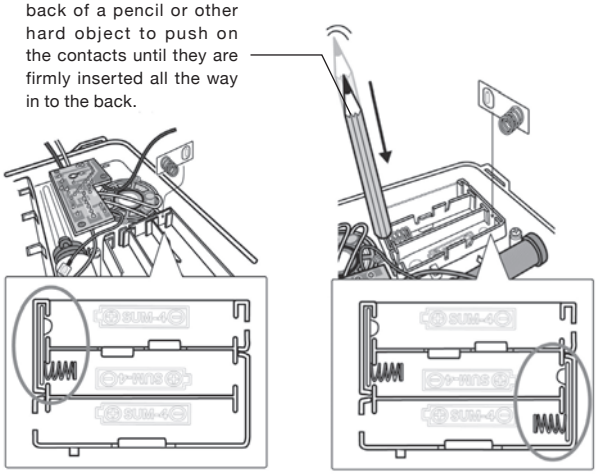


* Be careful not to damage the circuit with the screwdriver.

4 Insert the battery contacts into the battery box.

1. Insert the two battery contacts into the grooves in the battery box oriented as shown in the diagrams (be careful not to mix up the directions or locations in which they are placed.)

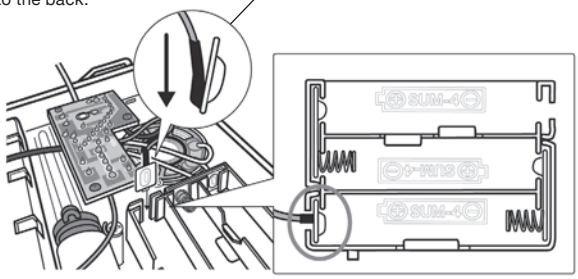
* After you have slid them into the grooves, use the back of a pencil or other hard object to push on the contacts until they are firmly inserted all the way in to the back.



2. Insert the battery contact with the red wire (for the plus terminal) into the groove in the battery box oriented as shown in the diagram.

* After you have slid them into the grooves, use the back of a pencil or other hard object to push on the contacts until they are firmly inserted all the way in to the back.

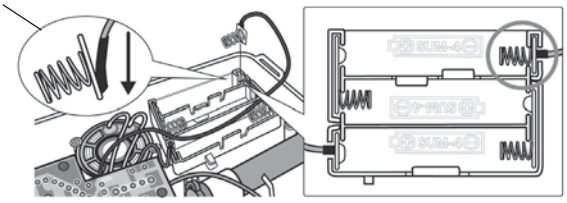
The wire and connector on the contact should be oriented downward.

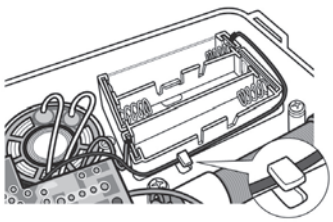


3. Insert the battery contact with the black wire (for the minus terminal) into the groove in the battery box oriented as shown in the diagram.

* After you have slid them into the grooves, use the back of a pencil or other hard object to push on the contacts until they are firmly inserted all the way in to the back.

The wire and connector on the contact should be oriented downward.



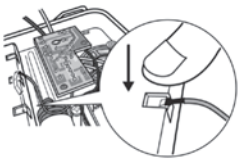


* Latch the black wire (which is attached to a battery contact) onto the hook in the battery box as shown in the diagram.

5 Attach the wires, which are attached to block terminals, in order of red, gray, and black, with the red wire going into the R hole in the main case, the gray wire in the G hole, and the black wire in the B hole

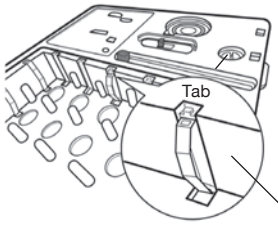
Basics for how to insert the block terminals

1. Push each of the block terminals in from the back to the front in the direction indicated in the diagram (oriented so that the metal protrusion is positioned on the outer side of the main unit). Lightly push on each of the inserted terminals from the back to push it into place.



* Only the metal part should be extended out into the front side. Do not push it so far that the black part to be covered extends out toward the front.

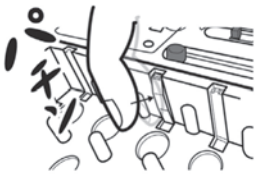
2. Turn the main unit back over, and check the condition and positioning of the metal contacts on the front side.



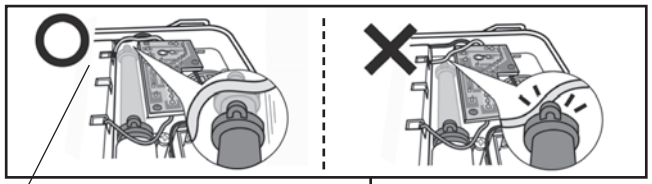
* When lightly pushing on the contact from the back, check to make sure that the end of the terminal is positioned as shown in the diagram.
If the end seems to be too low, push on the terminal a little bit to raise it up to the position shown in the diagram.

The head of the metal terminal and the tab should be at a height of about 1 mm (about 0.04 in.).

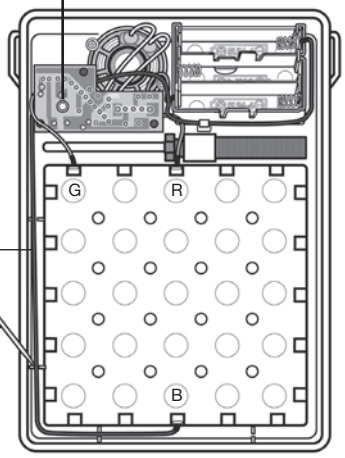
3. Push lightly on the protrusion on the terminal with a finger and slide it upward until the end of the terminal snaps into place in the tab.



Once you have inserted the block terminals into the main case in the order of red wire (R) → gray wire (G) → black wire (B), then double-check the wiring.



* Check to make sure that the gray wire does not get caught on the top of the protrusion when you move the tuning knob from the front. If it does appear to get caught, raise the gray wire up by around 2 mm (about 0.08 in.) to position it so that the tuning knob can be moved smoothly without causing problems.



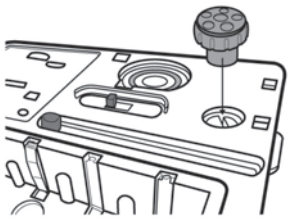
Black wire

Push the black wire into the three different grooves (push it in using the end of a toothpick).

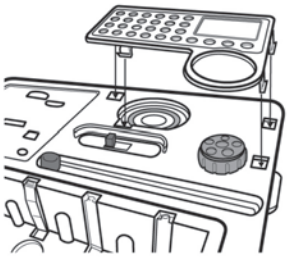
6 Attach necessary parts and other objects from the front side.

1. Insert the volume knob and firmly push until it is inserted all the way in to the back.

* Once you have inserted it, turn it all the way to the left as far as it will go (the lowest volume setting).

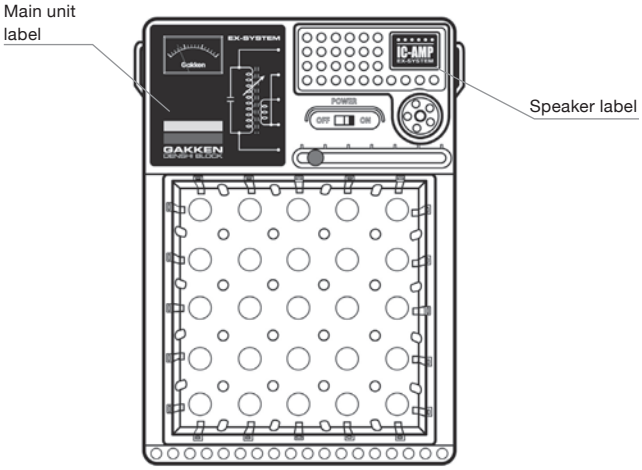


2. Attach the speaker cover from the front of the main case. Insert the four tabs into the holes and push down on each until it snaps into place.



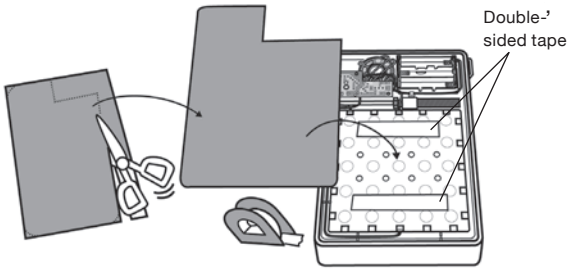
* Push each of the four tabs firmly into the main unit until they each snap into place.

3. Lastly, affix the main case label and speaker label. This completes assembly of the supplement.



If attaching a back cover

Cut along the dotted lines on one part of the box to make a back cover. Attach double-sided tape or

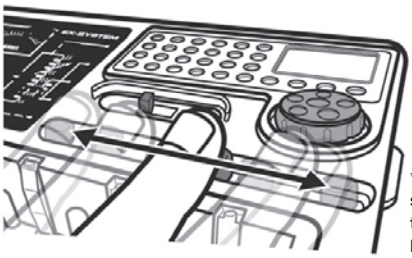


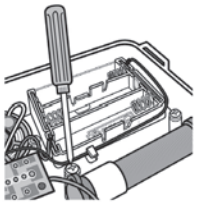
* Circuit experiments will still run without any problems even without a back cover.

Preparations to make before starting experiments ---Make sure to complete---

1 Check the turning of the tuning knob.

Try turning the tuning knob to the right and left. If it feels hard to turn it, move it left and right back and forth around fifteen times to loosen it up so that it turns more smoothly.



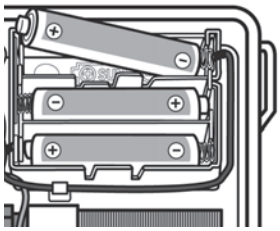


* If you cannot get it to turn smoothly no matter what you try, loosen the screw on the left side of the antenna coil one turn (counter-clockwise) as shown in the drawing.

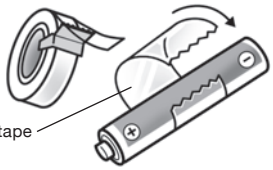
2 Insert the batteries.

Insert three new AAA batteries into the battery box, making sure to orient the plus and minus terminals correctly.

* Make sure that the power switch is turned off before inserting the batteries.



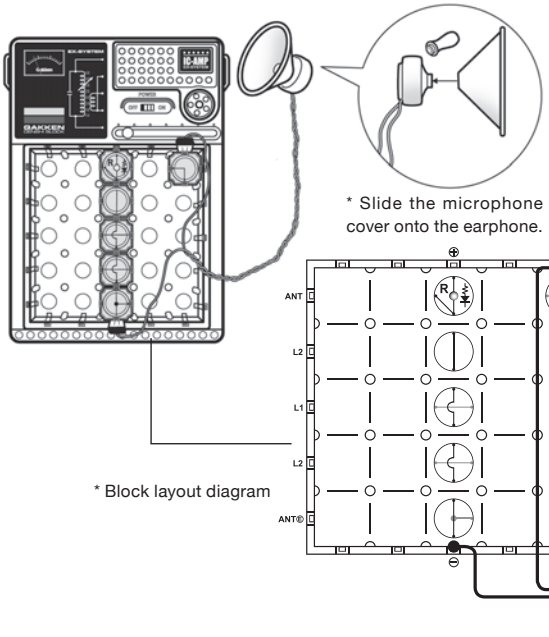
* Battery sizes may differ slightly by manufacturer. If the batteries appear loose and can be removed from the battery box easily, wrap each one in cellophane tape two or three times around as shown in the diagram below before inserting them.



Cellophane tape

3 Check the operation of the power supply and amplifier.

1. Insert the blocks and microphone (earphone with the microphone cover slid onto it) as shown in the diagram.

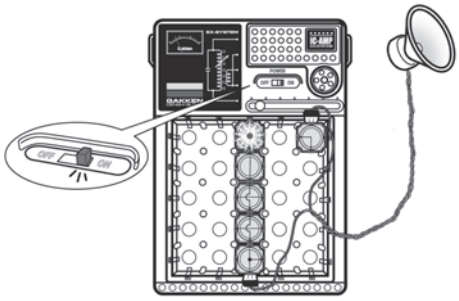


* Slide the microphone cover onto the earphone.

* Block layout diagram

2. Turn on the main switch. The power supply and red LED blocks will check out OK if the LED is lit up (check the green LED block in the same way).

* Make sure that the main switch is off before attempting to insert any blocks.



3. Turn the main switch on, and turn the volume knob to the right. Call into the microphone and check that sound is being output from the speaker; if so, then the internal amplifier is working correctly.

If you are not able to hear anything from the speaker, turn the volume knob even further to the right. * If there is any feedback like a whistling sound, then either remove the microphone or turn down the volume.

Put together Circuit No. 01 Transistor Detector and Circuit No. 02 Diode Detector, and use the two detector circuits to test the two transistors and two diodes.

Transistor blocks (There are two included.)

Diode blocks (There are two included.)

IMPORTANT

Once you have finished checking the transistors and diodes, make sure to finish completing the rest of the circuit.