

How to assemble and use

TOY RECORD MAKER

Estimated assemble time: about 60 minutes
※ You can see the assemble video on 大人の科学 .net(otonanokagaku.net)



Things included here

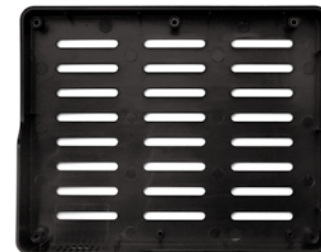
※ The Turntable rotates smoothly, so be careful not to apply any force.



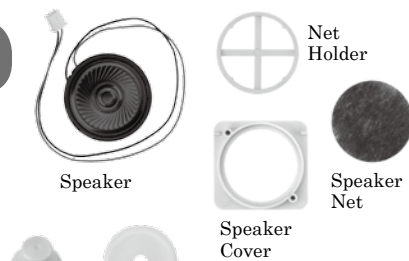
Main Unit (top)



Mat



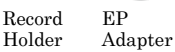
Main Unit (bottom)



Speaker

Speaker Net

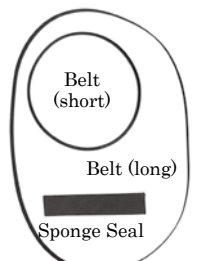
Speaker Cover



Record Holder

EP Adapter

Armrest



Belt (short)

Belt (long)

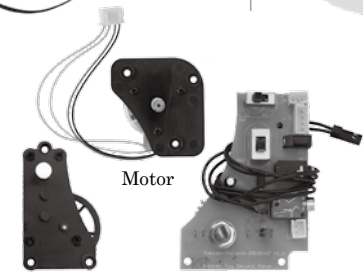
Sponge Seal



Knob x2



Volume Knob



Motor

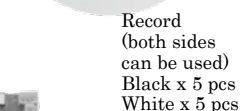
Pulley Gear

PCB

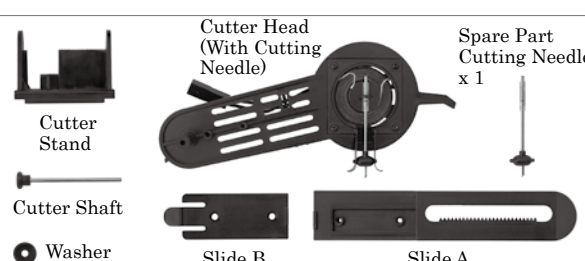


3.5mm Audio Cable (stereo / mono)

USB Power Cable



Record (both sides)
Black x 5 pcs
White x 5 pcs



Cutter Head (With Cutting Needle)

Spare Part Cutting Needle x 1

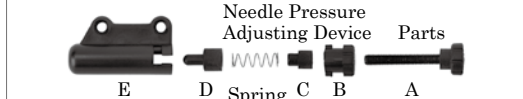
Cutter Stand

Cutter Shaft

Washer

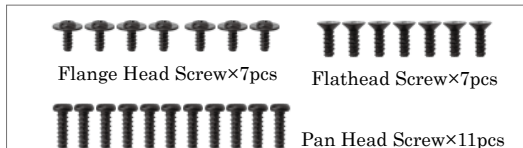
Slide B

Slide A



Needle Pressure Adjusting Device

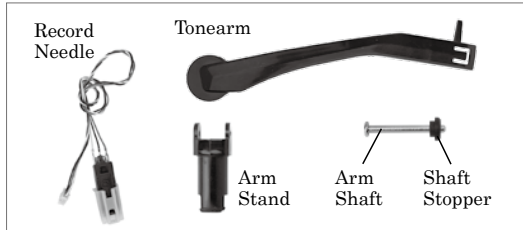
Parts



Flange Head Screw x 7 pcs

Flathead Screw x 7 pcs

Pan Head Screw x 11 pcs



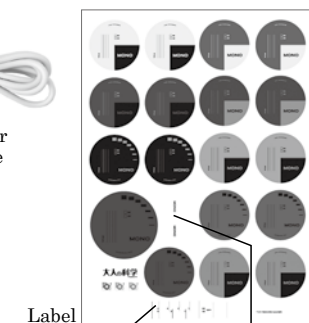
Record Needle

Tonearm

Arm Stand

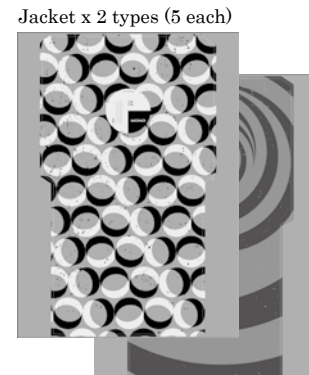
Arm Shaft

Shaft Stopper



Label 1 piece

MONO Seal



Jacket x 2 types (5 each)

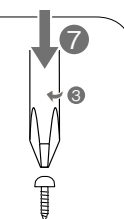


Things to prepare

Plus screwdriver, power supply with USB port (such as mobile battery, USB-AC adapter), sound source device with earphone jack (such as smartphone), headphone jack adapter (one for iPhone), cutter, ruler, glue.

Be careful with screwing.

When stopping the screw, make sure that the screwdriver is turned while pressing. The screws used are plastic type that cuts the groove. So screw down carefully. If too much force is applied when screwing down, the screw hole may be damaged. Basically, it is good to work with a pushing force of 7 and a turning force of 3.



<Warning> Be sure to observe the following to avoid fire or electric shock.

- If metal, water, or foreign matter gets inside the product while product is operating, disconnect the USB cable from the Main Unit.
- If smoke, unusual odor, unusual noise, drop, or damage occurs, disconnect the USB cable from the Main Unit.
- Do not use the USB terminal or power terminal if it is not completely inserted.
- Do not use the USB terminal or power terminal with dust attached, and do not bring any metal objects close to the terminal.



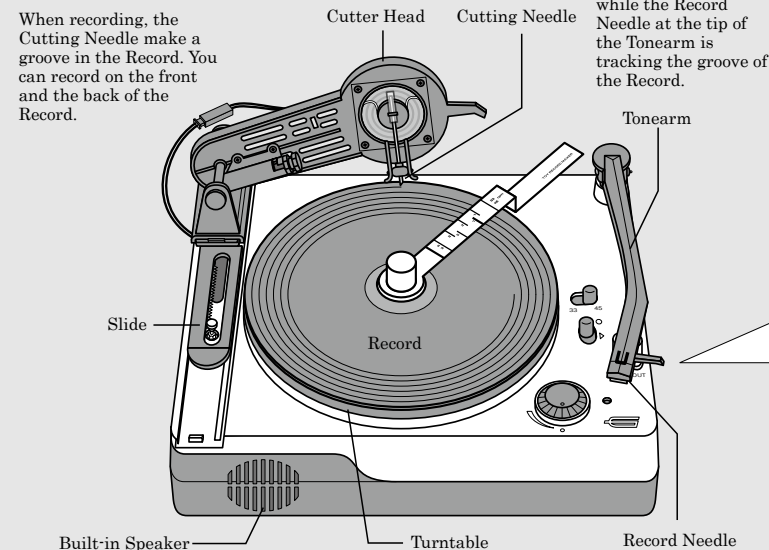
<Caution> For safety, please read the usage and precaution of this manual carefully before experimenting.

- There are small parts such as screws. Need to be careful not to let small children swallow the screws accidentally. Risk of suffocation may be involved.
- Sharp parts are included. Use extreme care when handling sharp parts to avoid injury.
- Do not disassemble or modify.
- Do not use if the Main Unit or the parts are damaged or deformed.
- Do not splash or get wet.
- Operating power is 5V 1.0A. Please use the USB-AC adapter for this operating power.
- After use, disconnect the USB cable from the Main Unit. Do not move when the cable is connected.
- Please operate on a flat and stable place. Do not install or store in an unstable place.
- Do not use and store in places exposed to oil slicks or steam, or in places with high levels of moisture or dust.
- When pulling the Cord to connect/disconnect the USB terminal or power supply terminal, be sure to hold the connector part. Also, do not insert or remove with wet hands.
- When cleaning, be sure to remove the USB cable from the Main Unit.
- Keep out of reach of small children when not in use.

We are committed to our product, but if you find any parts that are defective or missing, please contact the Editorial Department, and we will replace them with good products.
e-mail: okm@gakken.co.jp (If you contact us by email, be sure to include your address, name, and phone number in the email)

[Name of each part]

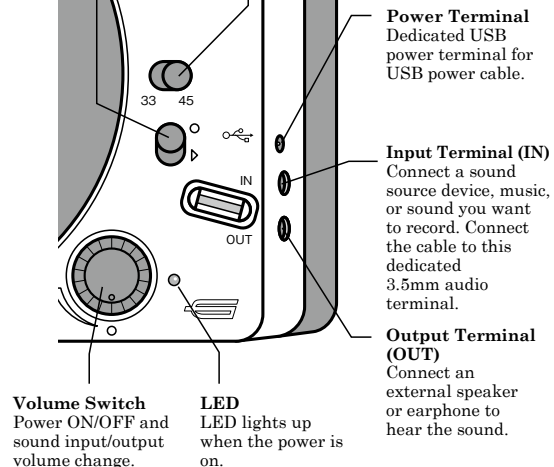
When recording, the Cutting Needle make a groove in the Record. You can record on the front and the back of the Record.



During the playback, the sound is made while the Record Needle at the tip of the Tonearm is tracking the groove of the Record.

Recording / Playback Switch
Recording Switch ○
Playback Switch ▷

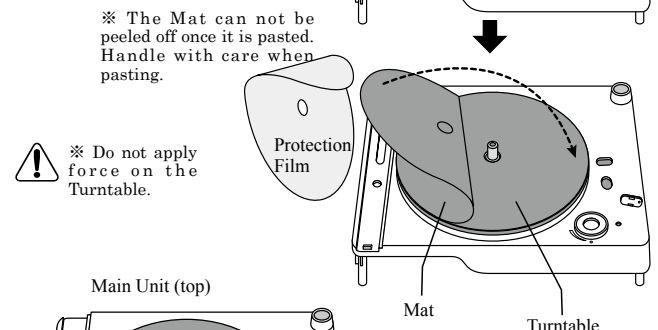
Rotation Speed Switch
33 → 33 1/3 revolutions per minute
45 → 45 revolutions per minute



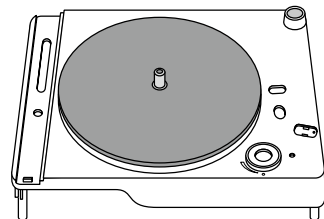
Assemble the Main Unit

1 Paste the Mat on the Turntable.

Align the hole of the Mat to the axis of the Turntable. Peel off a small portion of the Protection Film and then paste the edge at the correct position. Afterwards, peel off the rest to paste the Mat entirely.



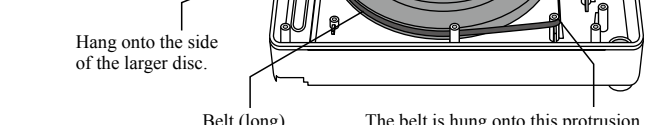
Main Unit (top)



2 Hang the Belt (long).

Turn the Main Unit (top) upside down. Hang the Belt (long) around the Turntable and the protrusion.

※ The belt can not be twisted. Be careful.

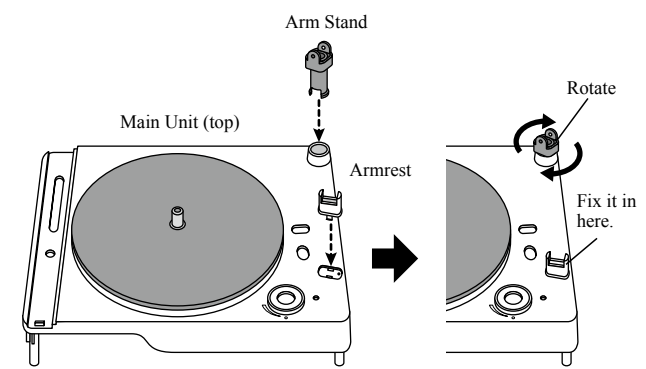


Belt (long)

The belt is hung onto this protrusion

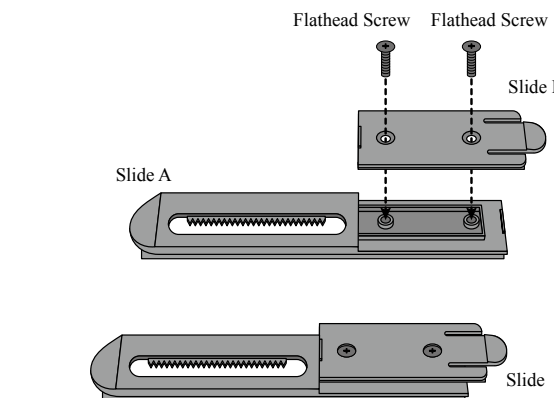
3 Attach the Arm Stand and the Armrest.

Put the Arm Stand and the Armrest into the holes on the Main Unit (top). Press the tip of the Arm Stand and push it in until it clicks. The Armrest has 2 claws and 1 protrusion on the bottom, insert accordingly into the hole.



4 Make the Slide.

Align Slide A and Slide B with the two screw holes. Fasten with Flathead Screws.



Flathead Screw Flathead Screw

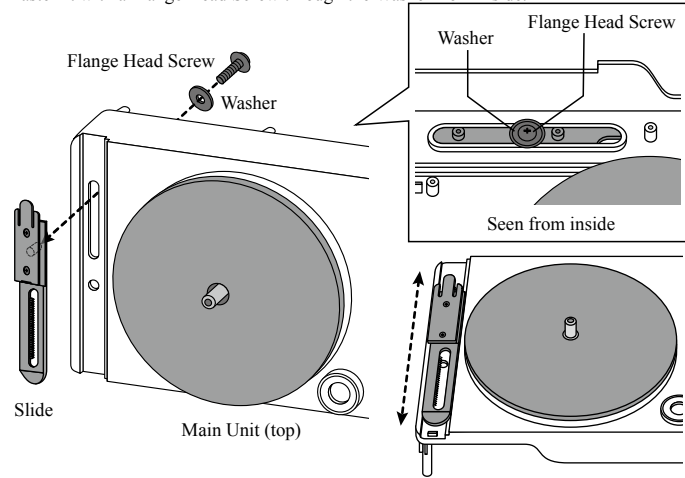
Slide B

Slide A

Slide

5 Attach the Slide.

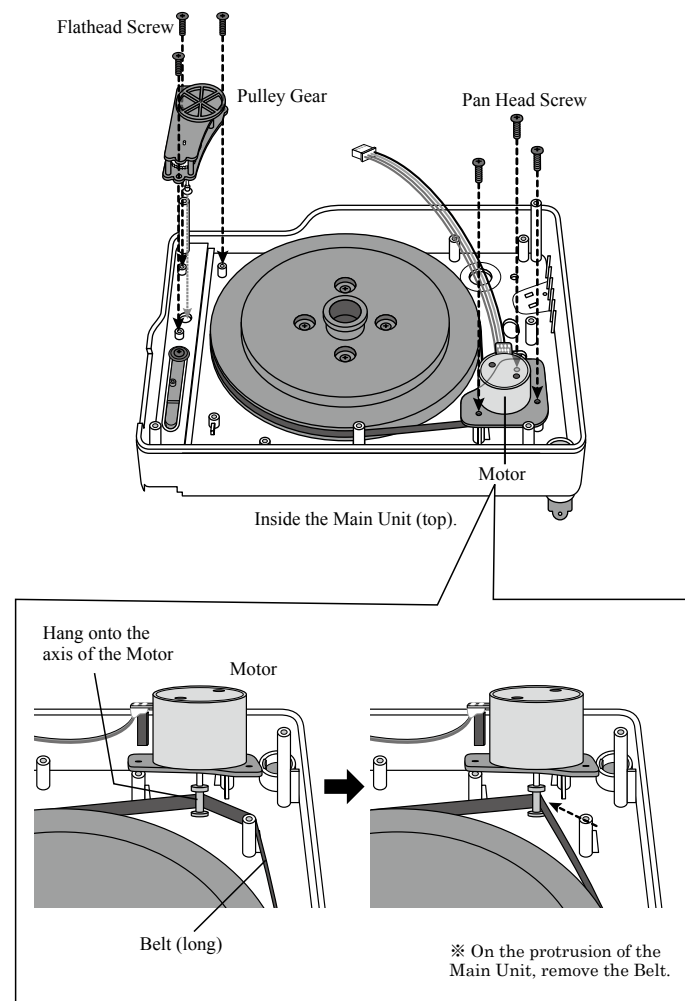
Insert the Slide into the groove at the end of the Main Unit (top) and then fasten it with a Flange Head Screw through the Washer from inside.



※ Move the Slide and check that it moves smoothly. If the movement is hard, slightly loosen the Flange Head Screw a little.

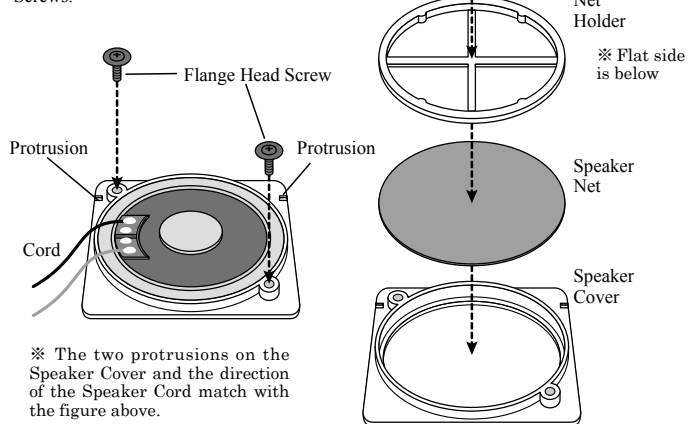
6 Install the Pulley Gear and the Motor.

At the upper left inside the Main Unit (top), align the Pulley Gear to the 3 screw holes and then fasten it with the Flathead Screws. Next, place the Motor on the lower right in accordance with the 3 screw holes and then fasten it with the Pan Head Screws. When attaching the Motor, re-attach the Belt (long) that was previously hung on the protrusion of the Main Unit to the axis of the Motor.



7 Assemble the Speaker.

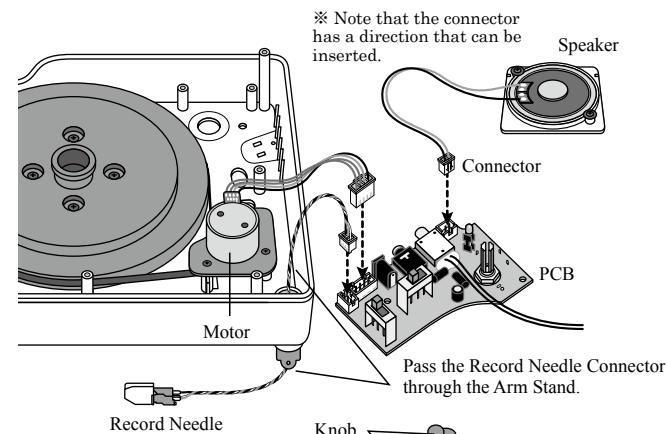
Insert the Speaker Net into the Speaker Cover. Then, insert the Net Holder from above. Finally, attach the Speaker and then fasten it with the two Flange Head Screws.



※ The two protrusions on the Speaker Cover and the direction of the Speaker Cord match with the figure above.

8 Assemble the PCB.

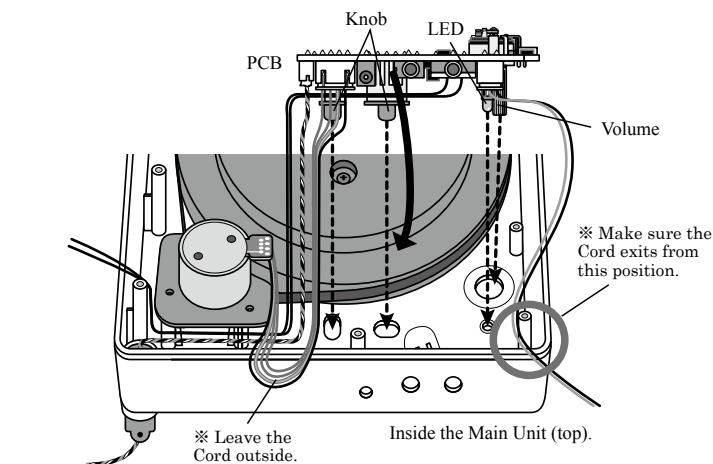
① Connect the Record Needle, the Motor, and the Speaker to the corresponding connectors on the PCB.



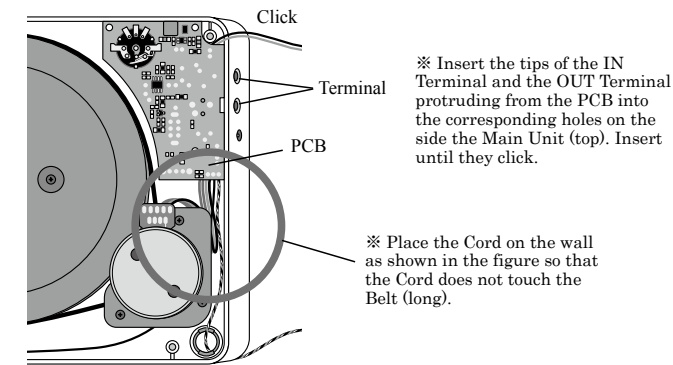
② Place the knobs on the switches of the PCB.

※ Note the vertical and horizontal orientation of the Knob.

③ Adjust the position of the PCB so that the Knob, the LED, and the Volume come out of the holes inside the Main Unit (top).

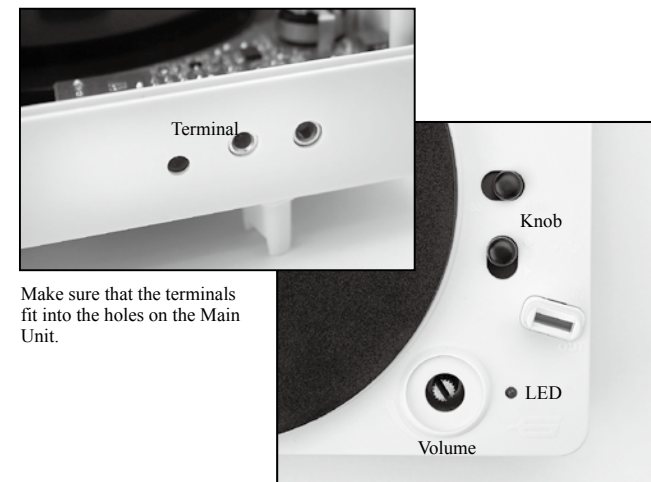


④ Push the PBC from above until it clicks.



※ Insert the tips of the IN Terminal and the OUT Terminal protruding from the PCB into the corresponding holes on the side the Main Unit (top). Insert until they click.

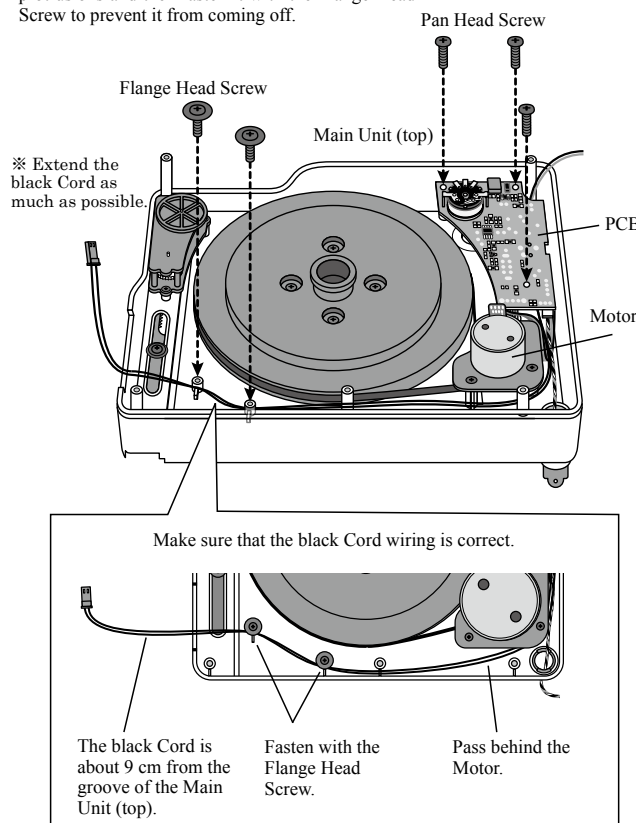
※ Place the Cord on the wall as shown in the figure so that the Cord does not touch the Belt (long).



Make sure that the terminals fit into the holes on the Main Unit.

Make sure that the Knob, the LED, and the Volume come out correctly.

⑤ Install the PCB on the Main Unit (top) by the 3 Pan Head Screws. Insert the black Cord protruding from the PCB into the gap between the 2 white protrusions and then fasten it with the Flange Head Screw to prevent it from coming off.



Make sure that the black Cord wiring is correct.

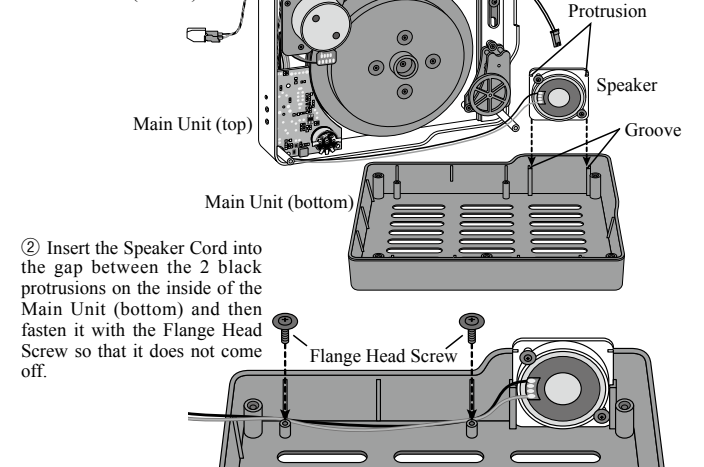
The black Cord is about 9 cm from the groove of the Main Unit (top).

Fasten with the Flange Head Screw.

Pass behind the Motor.

9 Install the Speaker.

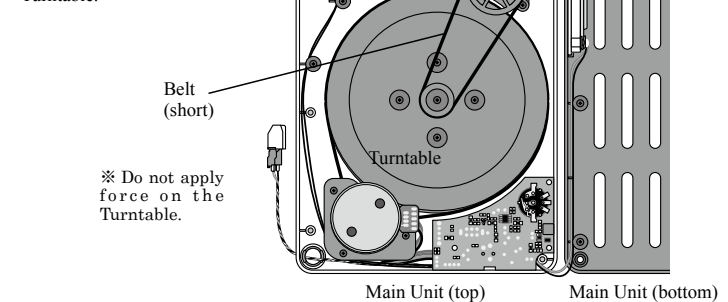
① Insert the Speaker Cover into the groove of the Main Unit (bottom).



② Insert the Speaker Cord into the gap between the 2 black protrusions on the inside of the Main Unit (bottom) and then fasten it with the Flange Head Screw so that it does not come off.

10 Hang the Belt (short).

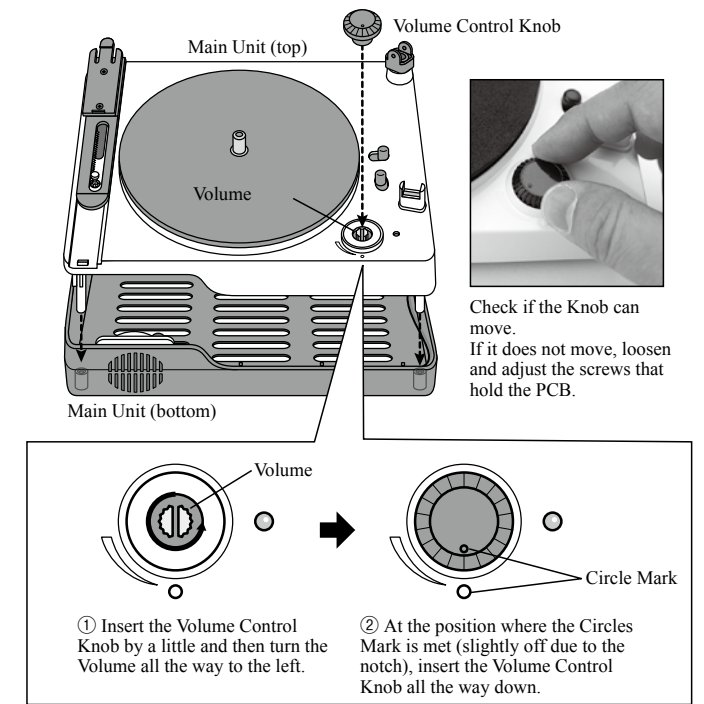
Place the Belt (short) around the Pulley Gear and the Turntable.



※ Do not apply force on the Turntable.

11 Assemble the Main Unit and attach the Volume Control Knob.

Assemble the Main Unit (top) onto the Main Unit (bottom). Do not screw down yet. In the below order, insert the Volume Control Knob into the tip of the Volume which can be seen from the hole of the Main Unit.



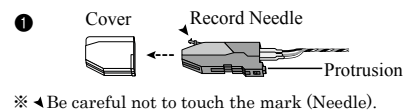
① Insert the Volume Control Knob by a little and then turn the Volume all the way to the left.

② At the position where the Circles Mark is met (slightly off due to the notch), insert the Volume Control Knob all the way down.

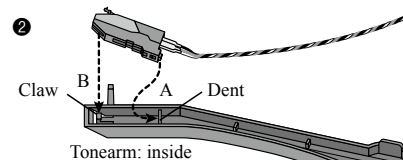
Assemble the Tonearm

1 Attach the Record Needle to the Tonearm.

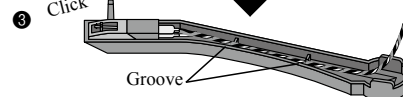
① Remove the Cover attached to the Record Needle.



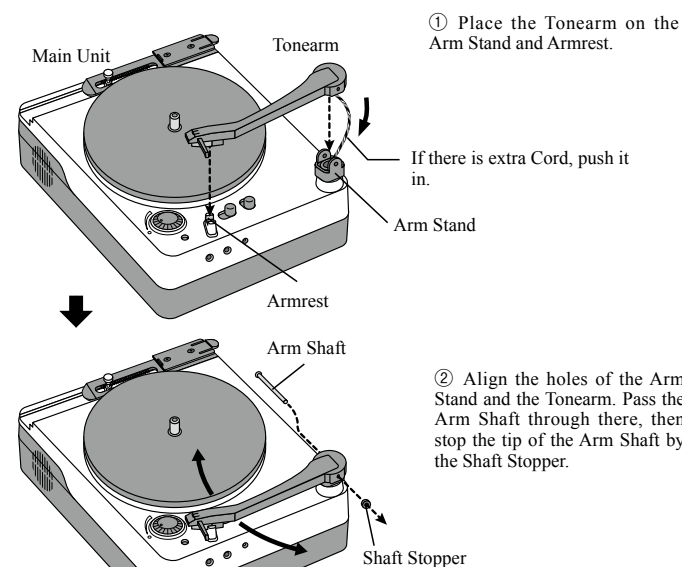
② Insert the protrusion of the Record Needle into the dent inside the tip of the Tonearm (A). Then push the other side into the claw part until it clicks (B).



③ Push the Cord of the Record Needle into the groove.



2 Attach the Tonearm to the Main Unit.



② Align the holes of the Arm Stand and the Tonearm. Pass the Arm Shaft through there, then stop the tip of the Arm Shaft by the Shaft Stopper.

※ Move the Tonearm widely left and right to check if it gets stuck.

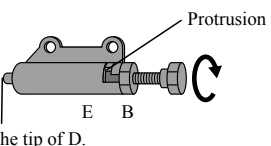
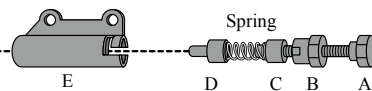
Assemble the Cutter Head

1 Assemble the Needle Pressure Adjusting Device.

Align the Spring to Part A ~ E of the Needle Pressure Adjusting Device.



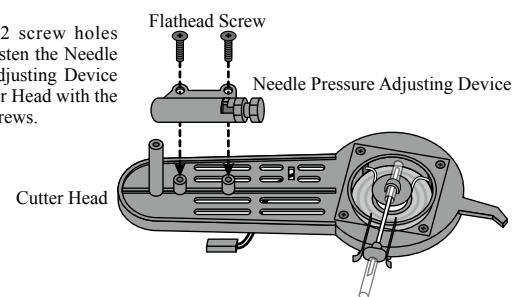
Turn A through B in clockwise direction. Press the tip of A into the hole of C firmly. Insert one end of the Spring through the protrusion of C, and insert the other end of the Spring into the hole of D. Put everything through E, rotate the protrusion of B and then stop.



The completion of the Needle Pressure Adjusting Device.

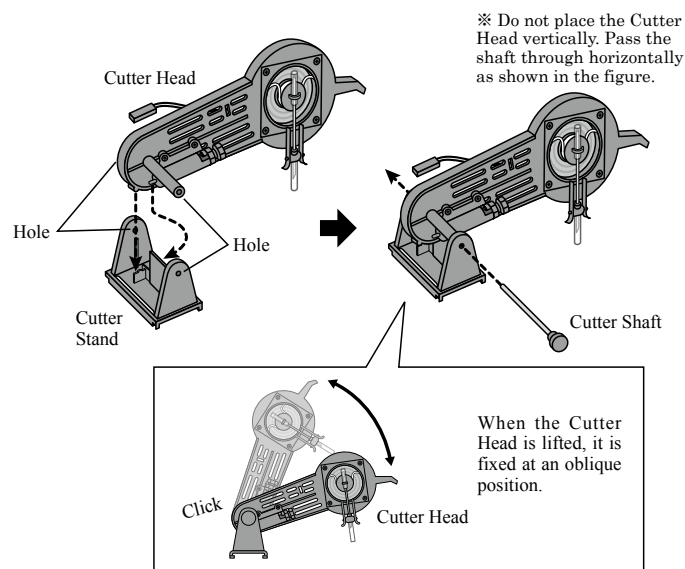
2 Attach the Needle Pressure Adjusting Device to the Cutter Head.

Align the 2 screw holes and then fasten the Needle Pressure Adjusting Device to the Cutter Head with the Flathead screws.

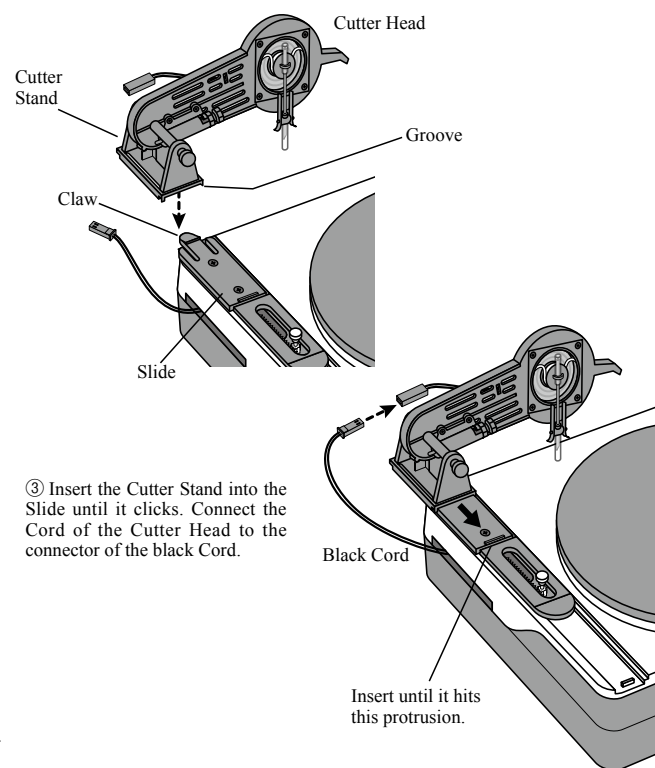


3 Attach the Cutter Head to the Main Unit.

① Position the Cutter Head and the Cutter Stand so that the holes are aligned. Then, pass the Cutter Shaft through.



② While pushing down the claw at the end of the Slide using the bottom of the Cutter Stand, slide the Cutter Stand through the grooves of the Slide. When removing the Cutter Stand, remove it while pushing down the claw.

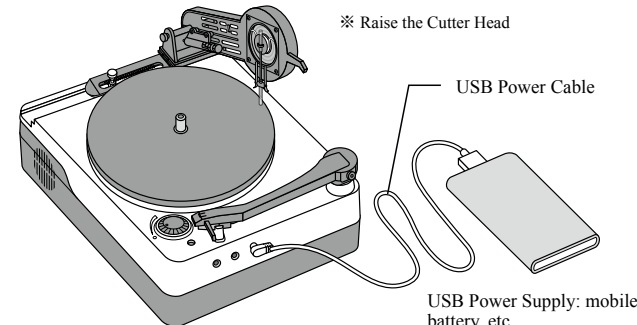


③ Insert the Cutter Stand into the Slide until it clicks. Connect the Cord of the Cutter Head to the connector of the black Cord.

Insert until it hits this protrusion.

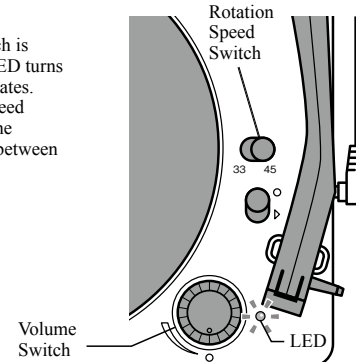
4 Check the operation of the Turntable.

Connect the Power Supply Terminal of the Main Unit to the Power Supply through the USB Power Cable. Then, check the operation of ①~②. If not working, remove the Main Unit (bottom). Then, check if the Belt (long) and (short) are removed or twisted and if the connectors have been correctly inserted into the PCB.



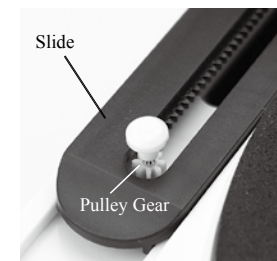
1

When the Volume Switch is turned clockwise, the LED turns on and the Turntable rotates. Change the Rotation Speed Switch and check that the rotation speed changes between 45 and 33.



2

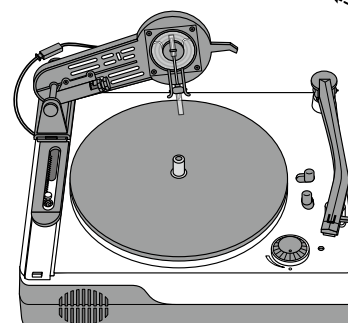
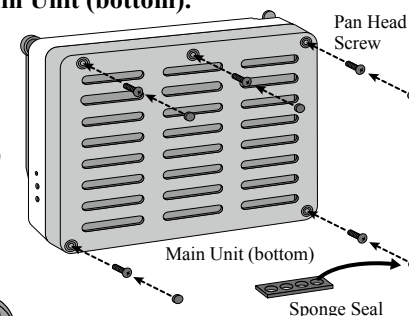
Make sure that the Pulley Gear (white) that protrudes from the Slide is rotating slowly.



5 After confirming the operation, attach the Main Unit (bottom).

Fix the Main Unit with 5 Pan Head Screws, and attach a Sponge Seal to each screw hole.

Main Unit (top)

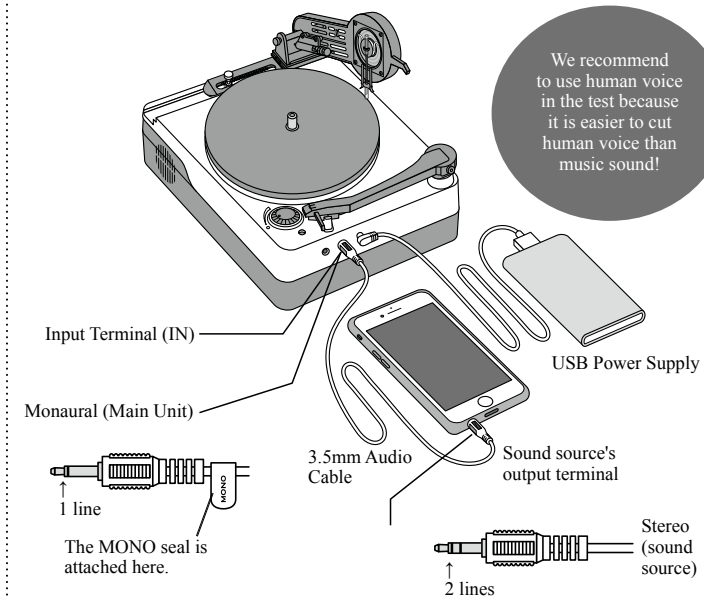


It's done!

Let's do the test cutting (recording)

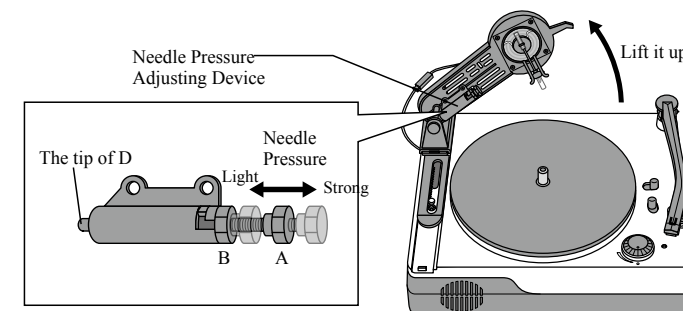
1 Connect the Power Supply and the sound source to the Main Unit.

Connect a sound source to the Input Terminal (IN) using a 3.5mm audio cable. Since this input is monaural, connect the monaural end of the cable to the Main Unit and the stereo end of the cable to the sound source device.



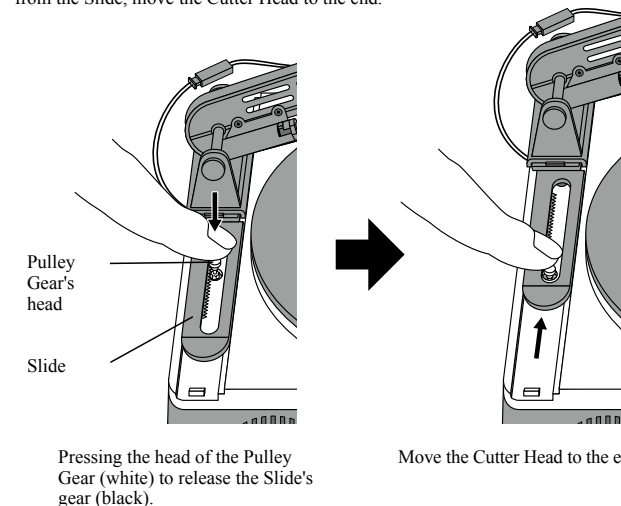
2 Prepare the Cutter Head.

① With the Cutter Head lifted, turn the Needle Pressure Adjusting Device counterclockwise so that the distance between A and B is about 1 cm.



The Needle Pressure Adjusting Device can change the needle pressure by adjusting the strength of the Spring.

② While pressing down the head of the Pulley Gear protruding from the Slide, move the Cutter Head to the end.

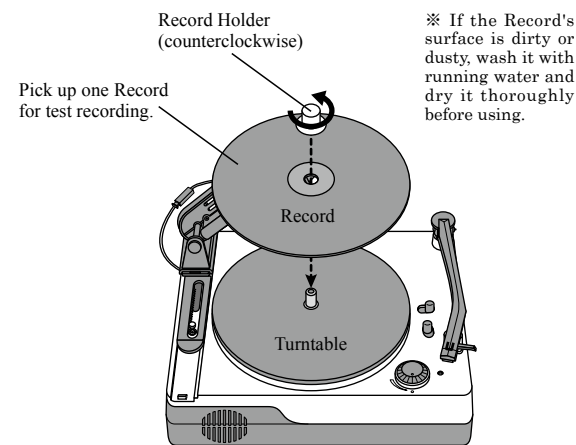


Pressing the head of the Pulley Gear (white) to release the Slide's gear (black).

Move the Cutter Head to the end.

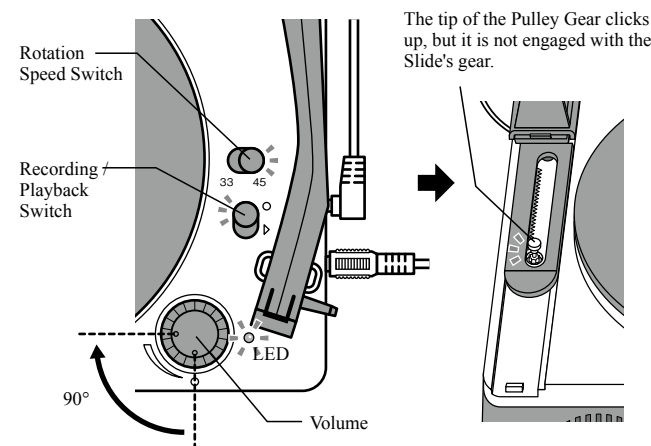
3 Set the Record.

Place the Record on the Turntable and turn the Record Holder counterclockwise to hold the Record.



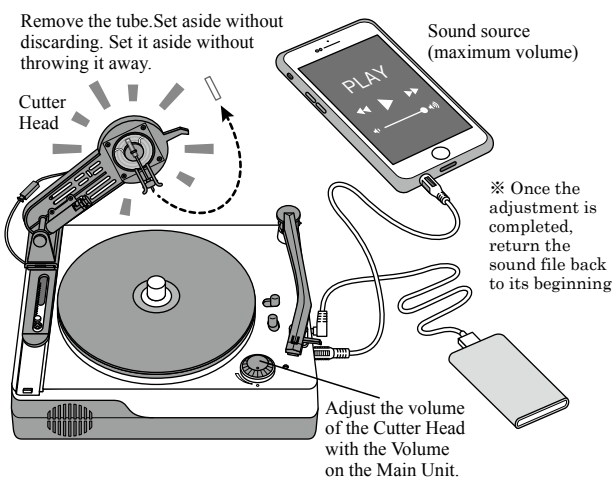
4 Set the Switch and the Volume Knob.

Set the Recording / Playback Switch to "o (Recording)" and the Rotation Speed Switch to "45 (right side)". When the Volume Switch is turned ON, the LED lights on and the Turntable rotates. Turn the Volume Knob to about 90°.



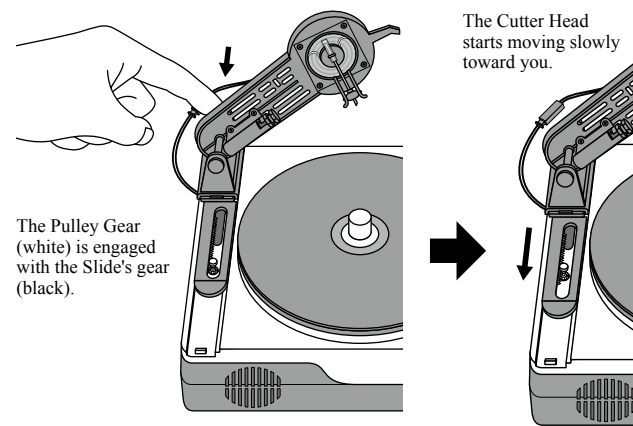
5 Play the sound source at the maximum volume and make sure that the sound is coming out from the Cutter Head.

If the sound is cracked or the Cutter Head is shaking, slightly lower the Volume of the Main Unit.



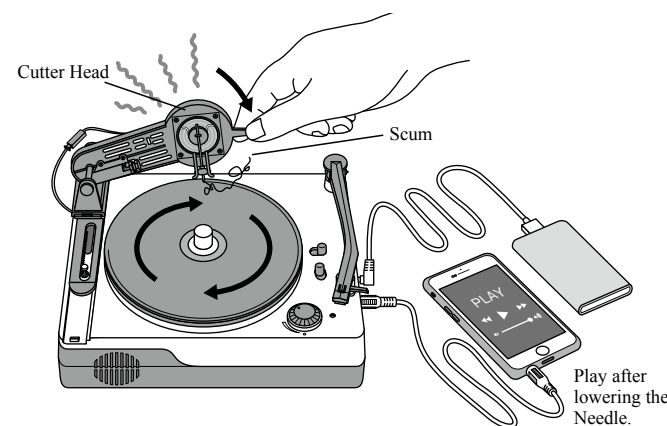
6 Start moving the Cutter Head.

Push the Cutter Stand slightly forward, and check that the gear is engaged and the Cutter Head starts moving slowly toward you.

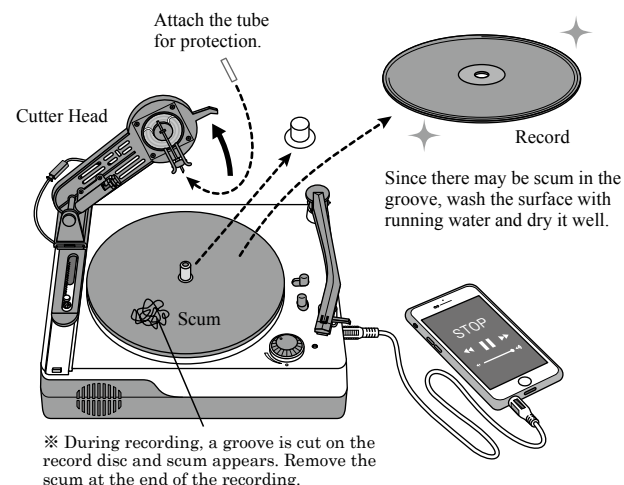


7 Lower the Cutter Head to play the sound source. Then, perform a test cutting for about 10 seconds.

① After lowering the Cutter Head gently and putting the Needle on the Record, play the sound source. The groove of the sound is being cut.



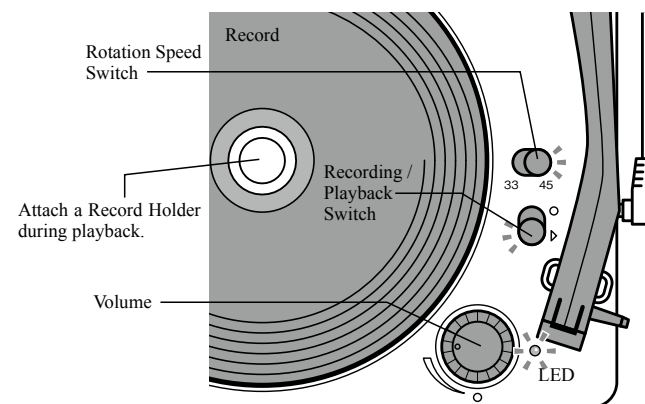
② Since this is a test cutting, after recording for about 10 seconds, raise the Cutter Head and turn off the power. Then, stop the sound source. This ends the test cutting.



Let's playback the recording

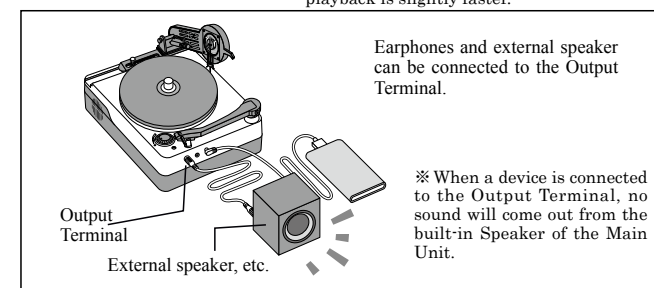
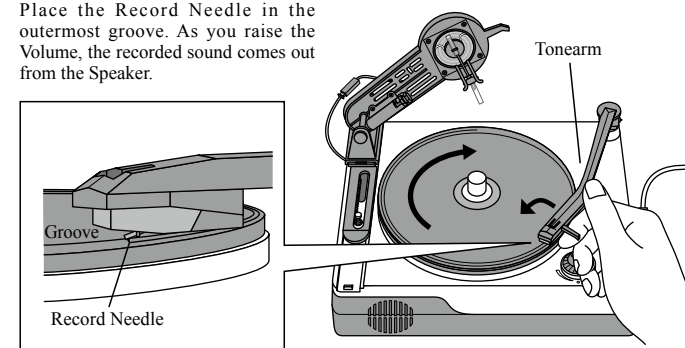
1 Set the Switch and the Volume Knob.

Set the Recording / Playback Switch to "▷ (Playback)". Make sure that the Rotation Speed Switch is set to "45". Turn on the Power and turn down the Volume.



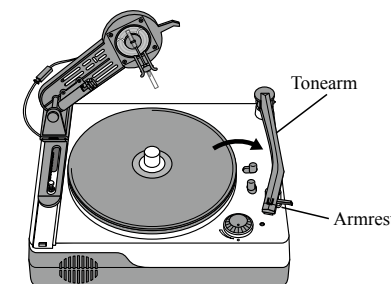
2 Raise the Tonearm and gently place the Record Needle.

Place the Record Needle in the outermost groove. As you raise the Volume, the recorded sound comes out from the Speaker.



3 When playback is finished.

Return the Tonearm to the Armrest and turn off the power.

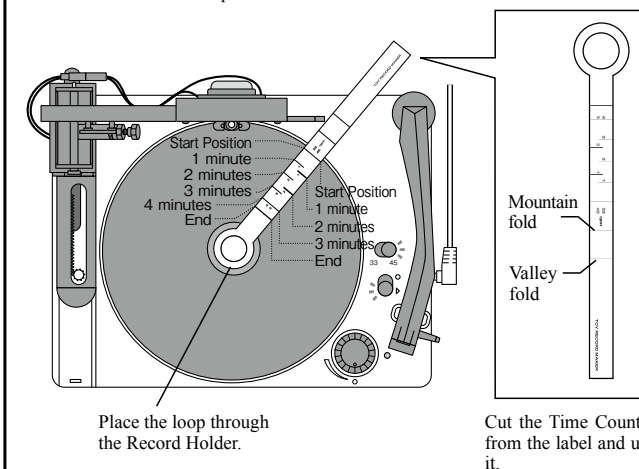


Adjusting Method

During the playback, if the noise is loud and the sound is low, or the needle jumps, refer to the next page. Adjust the sound source's volume and the needle pressure and then repeat the test cutting!

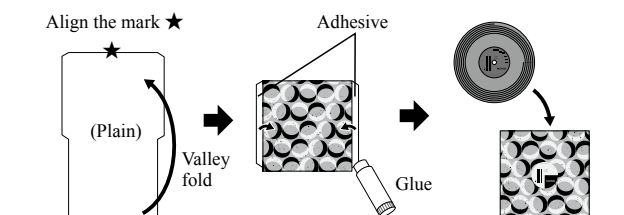
A convenient Time Counter that can show the recordable area.

If you put the Time Counter on the Record, you can see the starting and the ending positions of the cutting on the Record and the approximate recording time for each rotation speed.



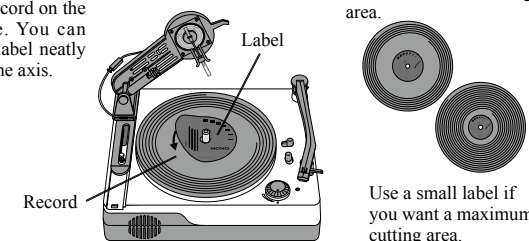
Let's make a record jacket.

Cut out the jacket from the jacket paper with a cutter and fold it in the middle by valley fold. Then, fold and glue the left and the right adhesive parts to complete the jacket.



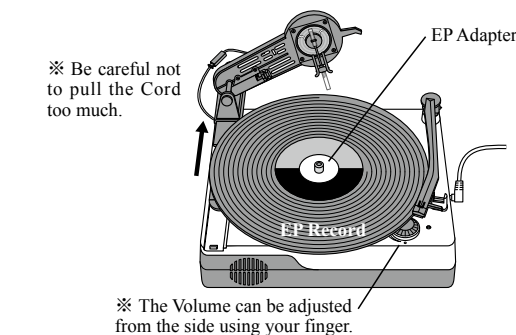
Label the Record

Put the Record on the Turntable. You can paste the label neatly by using the axis.



Let's listen to a commercial EP Record!

After moving the Cutter Head all the way back, push the claw of the Slide further down so that the Cutter Head protrudes about halfway out from the Main Unit. For a donut record, set the EP Adapter after placing it on the axis.



How to adjust the recording level on the next page.

How to adjust the recording level

In order to cut it properly, it is necessary to adjust the needle pressure and the Volume according to the sound source. You may not be able to record well at first, but repeat the test recording and playback while changing the needle pressure and the volume condition little by little to find the optimal balance.

Tip

The basic setting is to adjust the **Volume of the Main Unit to 90 degrees (at 9 o'clock position)**. Then, set the **needle pressure to a position where the screw is about halfway out**.

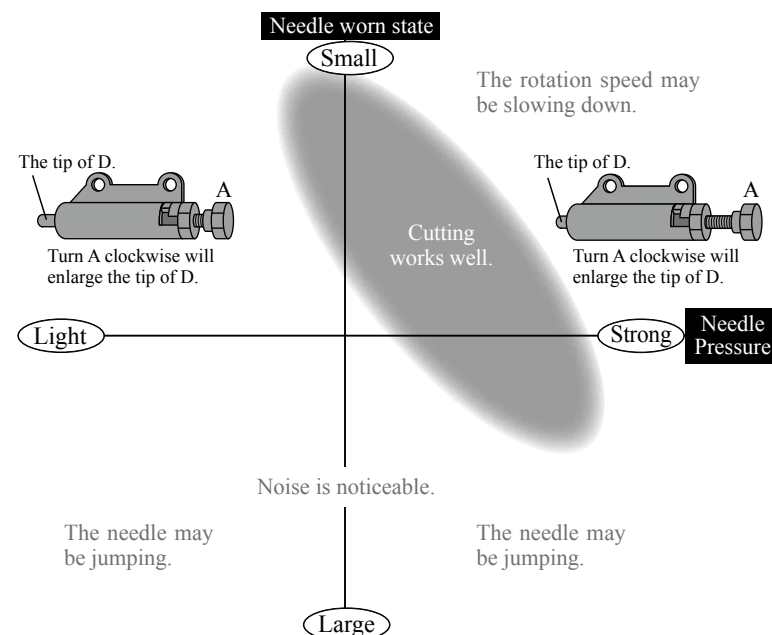
Perform a test playback and **raise the Volume if the needle is not jumping**.

In another test playback, try aiming for a volume as low as possible without the needle being jumping.

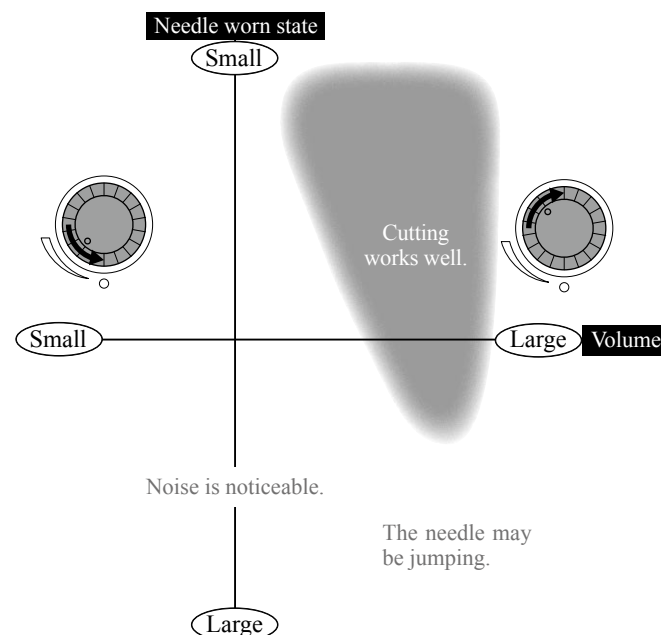
Since the most influential factor in cutting is the worn state of the Cutting Needle, **repeat the test in the shortest amount of time possible**.

To adjust the needle pressure and the volume, refer to the graphs below.

Relationship between the worn state of Cutting Needle and Needle Pressure



Relationship between the worn state of Cutting Needle and the volume of sound



Method to reduce needle jumping

Depending on the sound source, the needle may jump even with the above adjustment.

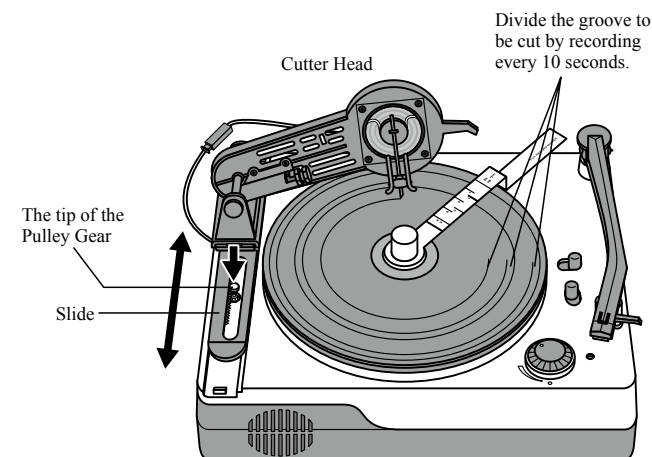
In that case, **using an equalizer can improve the needle jumping condition**.

Read the article on page 32 and try the cutting.



In the test cutting, in one record disc, record several sounds of about 10 seconds in length.

Push the tip of the Pulley Gear coming out of the Slide. Move the Cutter Head and then record the sound from the middle of the record where the groove has not been cut yet.

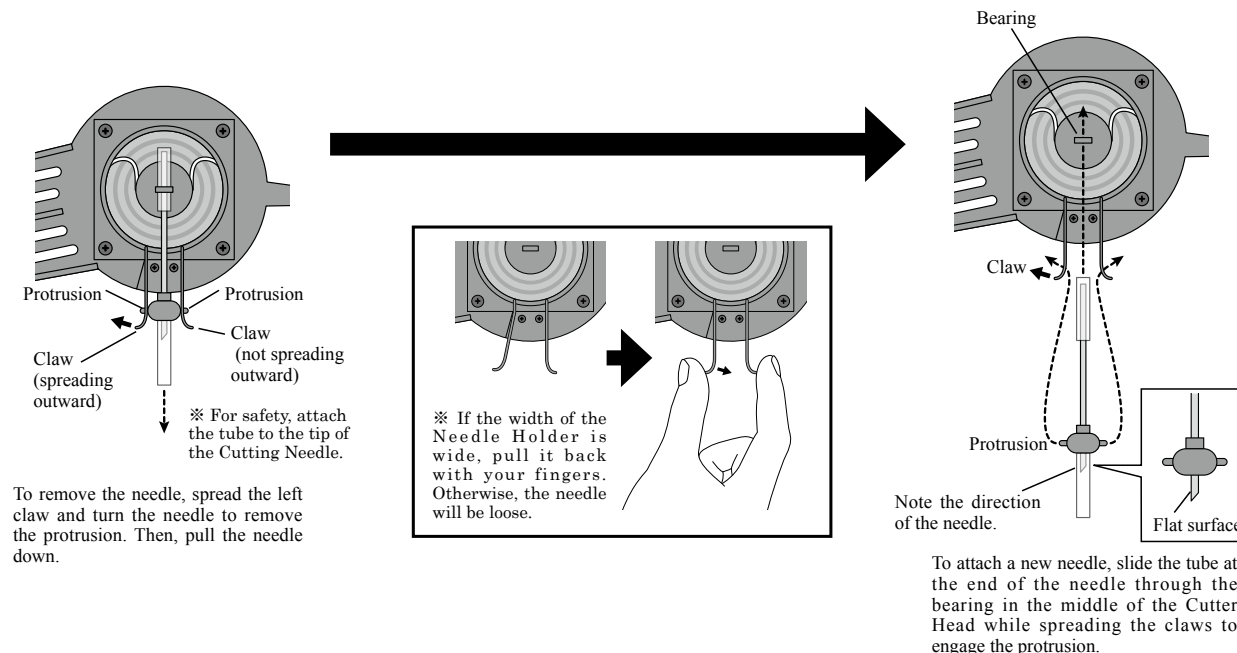


※ As the tip of the Pulley Gear reaches to the end, remove the needle so that it will not continue looping the same groove and damage the Record. Carefully check the time counter for the recording time.

What if the Cutting Needle is worn? Method to replace and check the Needle.

Change the Cutting Needle

The blade of the Cutting Needle wears out after recording many times, causing the recorded sound to be noisy. Replace with a new needle if you are concerned about the noise.

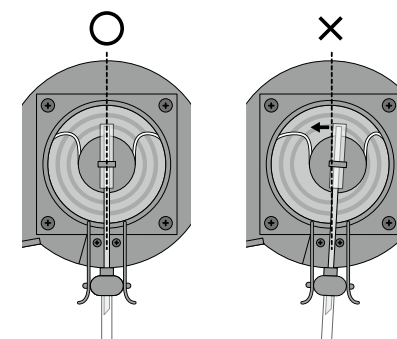


Check here after setting the Cutting Needle!

If the Cutting Needle is not set correctly, the vibration of the sound can not be transmitted properly and the movement of the needle will be weakened. Also the noise will increase due to the needle trembling.

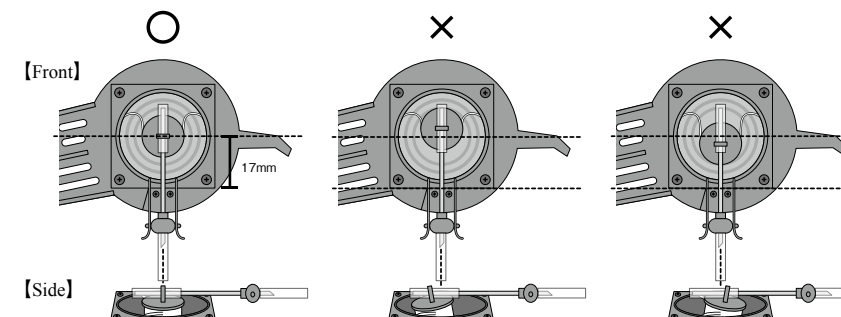
1 Is the center of the needle out?

Move the needle with your finger so that it is in the center.



2 Is the bearing position of the Cutter Head correct?

When the bearing of the Cutter Head is exactly in the middle of the square frame, it transmits the vibrations to the needle neatly. If the position of the bearing is shifted up or down, adjust it back to the middle.





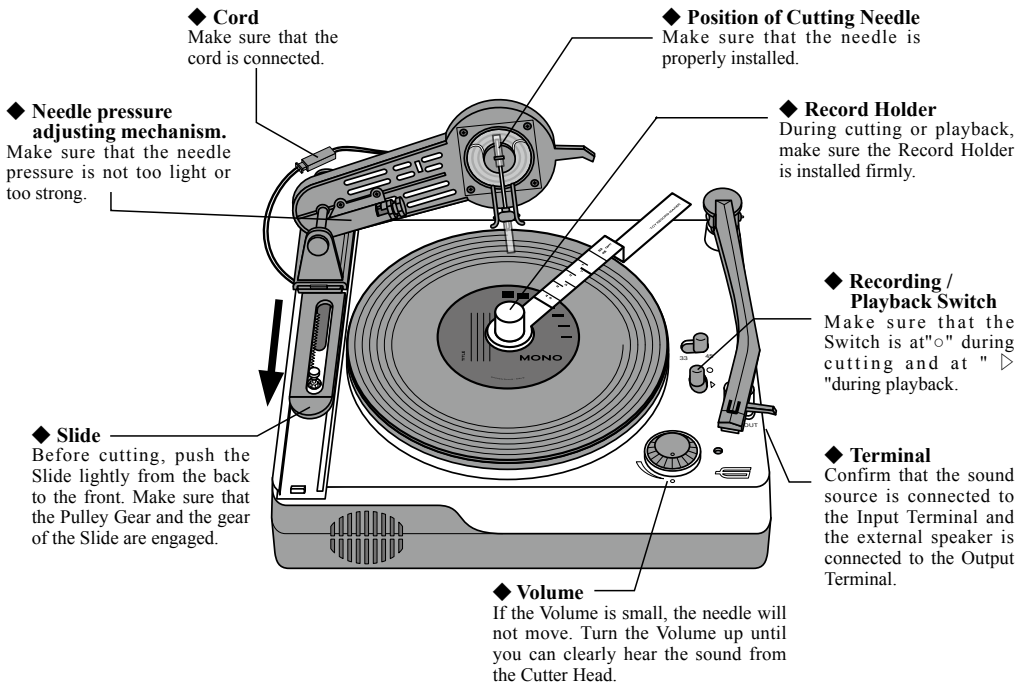
Q : The Record is not cut well.

A : ① Refer to the figure on the right to make sure that the assembly and the setting are correct.

② The Cutting Needle may be worn. Replace the needle and try again (P69).

③ Check if the mounting direction of the Cutting Needle is correct (P69).

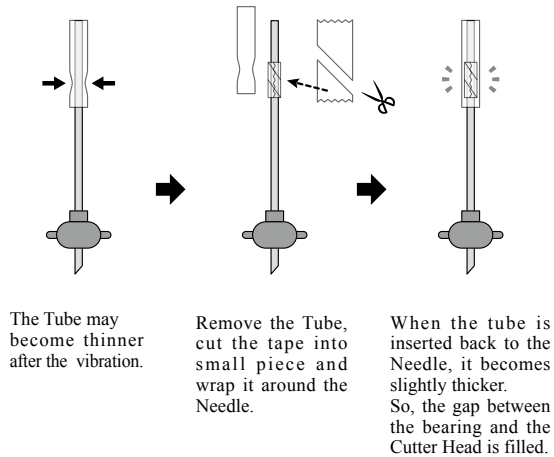
④ If the Record is dirty or covered with dust, wash it off with running water or diluted neutral detergent and dry it thoroughly before using.



Q : The sound coming from the Cutter Head is trembling.

A : If the Needle Holder is wide, the noise will be heard. See page 69 for how to narrow the width of the Needle Holder.

Also, if there is a gap between the bearing of the Cutter Head and the Tube of the Needle, the vibration can not be transmitted properly to the needle and the sound will be trembling. In this case, wrap a small tape around the Needle as shown below to fill the gap.



Q : The scum from the cutting hinders the movement of the Cutting Needle.

A : If scum accumulates, it may get under the Needle or get stuck in the Record Holder, causing the Needle to jump or creating noise.

In that case, please blow off the scum during the cutting with your breath or with a dryer.

Q : The Needle is jumping.

A : If the volume level of the sound source is too high, the vibration of the Needle may be too high and the sound may not be inputted properly. Read the article from Page 68 and Page 32 to try out the equalizer.

Q : I can not record a high volume level of sound and the noise is big.

A : If the volume level of the sound source is low or the output of the device is weak, sound may not be inputted properly. Read the article from page 32 and try out the preamplifier or the equalizer.

● Plastic materials used in this kit

Needle Pressure Adjusting Device A ~ E, Arm Stand, Washer, Shaft Stopper (black): POM
Mat, Sponge Seal: EVA, Belt long/short: synthetic rubber, blank record: PS, Other parts: ABS

● Metal materials used in this kit

Arm Shaft, Cutter Shaft, Spring (nickel plating): iron, Screws: iron, Cutting Needle: alloy

※ When no longer needed, please dispose the device according to the rules of each local government.