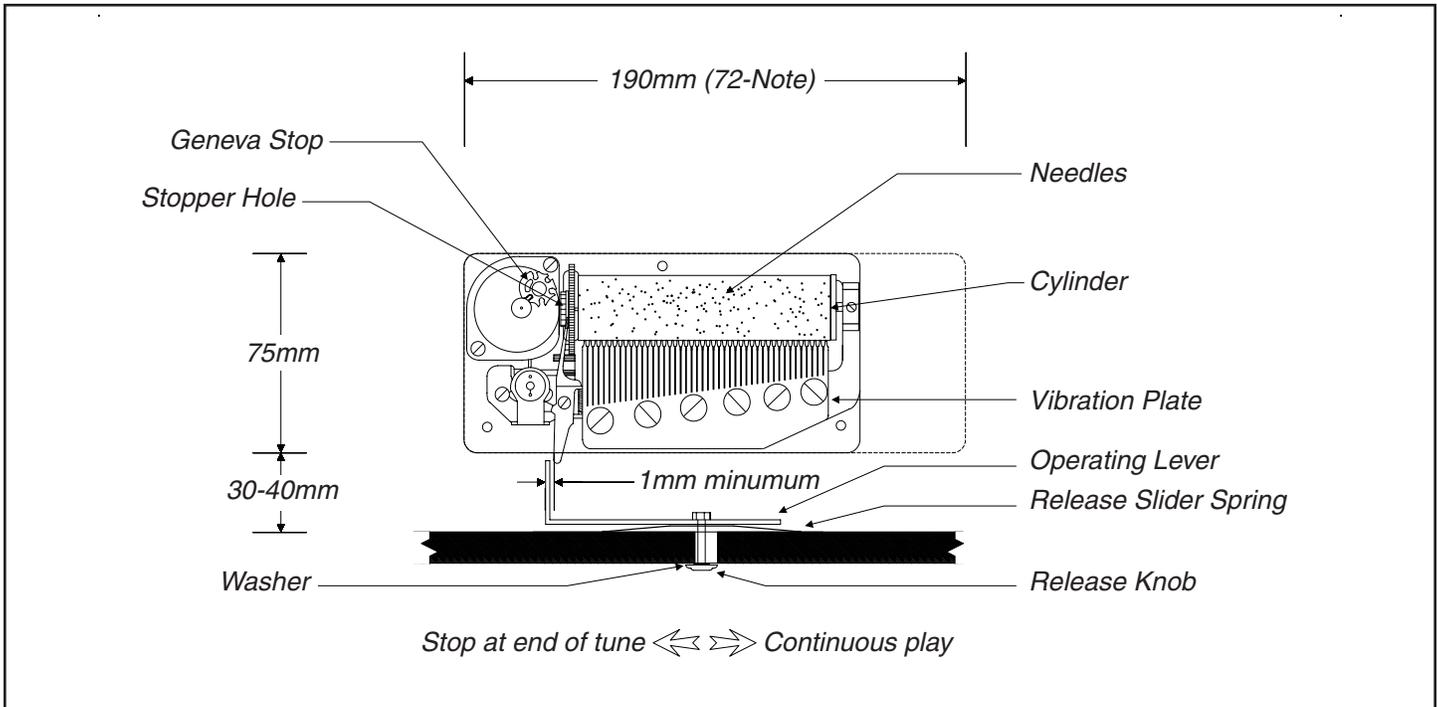


# 72-Note Musical Movements



**Please be sure to read and understand all instructions before using the musical movement.**

Sankyo has defined Japan's history of musical movement production for more than half a century, and its Orpheus series of multi-note deluxe music movements has ideal sound quality. As the number of notes increases, the beauty of the sound comes to life with fuller tonal richness.

## Features

The movement has a five octave range and plays for as long as 5 minutes on a single winding. The stopper lever automatically stops the mechanism at the end of the tune, unless the release knob is engaged to allow for continuous play. 72-Note movement tunes are about a minute long, and the movement is about 7½" wide x 3" deep x 1⅜" high. The winding stem is about 7/16" long, including the 1/8" threaded stem. Includes the movement, winding key, mounting screws, tune label and sliding release knob hardware.

## Special handling, positioning and adjustment

The movement has been individually precision-machined, assembled and adjusted for optimum musical performance and satisfaction. The spring structure, the time-controlling multiplying gear and the governor, in particular, have been manufactured and finished with the greatest care. Be sure to handle all movements with utmost care to ensure that none of these precision parts is distorted or deformed. **Always wear cotton gloves** when handling the movement and grasp it only by the base. Touching the base with bare hands allows perspiration from the skin to transfer to the vibration plate, causing it to rust. Non-cotton gloves may be slippery and increase the risk of accidentally dropping the movement and causing serious damage.

**Make absolutely sure not to touch the cylinder, gears, vibration plate or governor mechanism.** Touching any parts except the base is liable to cause deformation of the cylinder needles, vibration plate, gears, and/or friction governor assembly, which will negatively affect sound quality.

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**CAUTION:** NEVER re-adjust or modify any part or parts of the movements – in particular:

- DO NOT RE-ADJUST the mounting screws securing the vibration plate.
- DO NOT RE-ADJUST the adjustment cap on the friction governor assembly.
- DO NOT DEFORM the vibration notes (springs).
- DO NOT RE-ADJUST the cylinder-retaining screws.
- DO NOT RE-ADJUST the stopper lever.

It is particularly important NOT to re-adjust or deform these five items under any circumstances. In addition, any modification due to the replacement or addition of parts or attempts to oil any parts of the movement will affect the function, performance and overall quality of the movements.

## Environmental requirements

The movement is particularly sensitive to dust and humidity. Make sure not to operate the it in locations with much dust or dirt or in high humidity. Dirt and dust particles will adhere to and lodge on the gear train, causing it to jam. Moisture from high-humidity environments will deposit on the vibration plate, cylinder and needle tips, causing them to rust.

## Box construction considerations

Do not use extremely hard (e.g., ebony) or extremely soft material (e.g., balsa) for the box, and be sure to use only stable, straight-grained wood that has been dried through either natural or artificial means to a water content of around 4-5%. The acoustic amplification properties of extremely hard and soft types of wood are not good; and wood warpage can cause deformation or distortion of the box and resonator frame, resulting in incorrect musical performance.

The bottom of the box typically doubles as the resonator or sounding board for the movement. If possible, construct the resonator board from a core material (e.g., luan chip board that has been properly dried) with a fascia board or veneer glued on to both sides. If using solid wood for the resonator board, be sure to select straight-grained non-warped wood that has been properly dried. The resonator board should be 5/32" to 9/32" thick and flat to within 0.01". The thickness of the resonator board affects the volume and timbre of the music box, and unevenness or deformation of the resonator board will distort the alignment of the cylinder and vibration plate through misalignment of the movement base, affecting sound quality and performance.

Typical woodworking adhesives often contain formalin or other formaldehyde-releasing components, which can cause the vibration plate to rust. Be sure to use a non-formalin-type adhesive to construct the box; and if you incorporate chipboard, make sure it does not contain formalin or other formaldehyde-releasing components.

Always design the box to position the movement with the winding shaft facing down. Mount the movement in an orientation that at least maintains the cylinder in a horizontal position end to end, and preferably keeps both the base and the cylinder in a horizontal position. If the movement must be mounted at a slope, ensure that the angle of slope is well less than 90 degrees. Musical performance during play will be affected if the attitude of the cylinder is not set correctly, and it may also not be possible to change tunes properly.

Design the box to seal out dust, moisture and humidity and to protect the movement from being touched.

Be sure that the space surrounding the winding key wings and shaft is clear; contact with the box or support surface will reduce the driving force for the movement and eventually cause it to stop. The hole through the resonator board for the winding key should be 25/64" to 7/16" in diameter.

Check that the feet supporting the case are flat and perfectly even for firm, wobble-free support; wobbling can result in a humming sound. To eliminate wobble and also prevent the box from slipping and falling, glue a thin pad of felt or similar material to the base of the support foot. Keep in mind that a properly constructed box can still hum if the surface supporting the box is not perfectly flat.

## 72-Note Musical Movements

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Make absolutely sure that there is no dirt or dust inside the box or adhering to the movement. Ensuring a dust-free interior helps prevent sound distortion caused by contamination of the cylinder, friction governor assembly or vibration plate. Ensure that you do not touch the movement, either by hand or with a vacuum tool. Do not use an air blast to clean the movement – it can damage or deform precision parts and can remove intentional lubrication, shortening the life of the movement.

The position of the movement in the box depends on the location of the sliding release assembly. To install the sliding release assembly, a groove  $7/16" \times 3-3/8" \times 1/16"$  must be cut into the inside wall of the box to guide the release slider spring. The bottom edge of this groove should be  $11/16"$  above the top of the resonator board. Drill a  $5/16"$  diameter hole through the center of the groove for the decorative release knob. Place the release slider spring into the groove; assemble the L-shaped operating lever, plastic protective washer, release knob and nut, and tighten the nut firmly.

Move the release knob as far to the left in the  $5/16"$  diameter hole as possible; then position the music movement so that there is a  $1/64"$  gap between the movement stopper lever and the sliding release assembly operating lever. To ensure the sliding release properly engages and releases the movement stopper lever, you may need to bend the release assembly operating lever slightly once the movement is mounted.

Mark the movement mounting hole locations, remove the movement and drill the mounting holes. To hold the movement safely in place while mounting it in the box, consider preparing a simple jig to safely hold the movement base upside down and with the box inverted on top of the movement; the jig should touch the top of the base only near the three mounting holes.

Secure the movement in place, using all three mounting screws; progressively snug the screws in an alternating pattern (to avoid deforming the movement) to a final torque of around 8.7 lb.-in. The musical performance and sound quality will suffer even if only one mounting screw is not fastened properly, or loosens due to shock or impact.

With the movement mounted, adjust the distance between the stopper lever and the sliding release assembly operating lever. **DO NOT MAKE ANY ADJUSTMENT TO THE STOPPER LEVER ON THE MOVEMENT – ADJUST ONLY THE SEPARATE L-SHAPED OPERATING LEVER.** Gently bend the operating lever with a pair of pliers to suit the curvature of the stopper lever, and so that the front tip of the stopper lever will not lift and contact the top of the spring housing when the operating lever is moved during continuous play.

If the box design incorporates glass in the top or side panels, take appropriate precautions to prevent any vibration of the glass due to the operation of the movement; this can lead to a humming or rattling noise.

### Transport and storage considerations

Store the movement in a cool, dry place and leave the movement in the original packaging until it is installed. Before transporting or storing the movement or a completed box, it is important to prepare the movement properly. Serious damage can occur if an impact is sustained while the movement is playing. To prevent the stopper lever from becoming unlocked in transit or storage, engage the Geneva stopper and check the position of the stopper hole, winding the key so that the Geneva stopper is engaged just shortly before the stopper lever enters the stopper hole to stop play. Then wind the key one gear tooth at a time until the Geneva stopper locks into the stopper hole. When placing the movement or box in a carton for shipment, be sure not to position it with the bottom surface of the movement facing upward; this can lead to deformation of the friction governor mechanism, causing the play timing to change or stop.