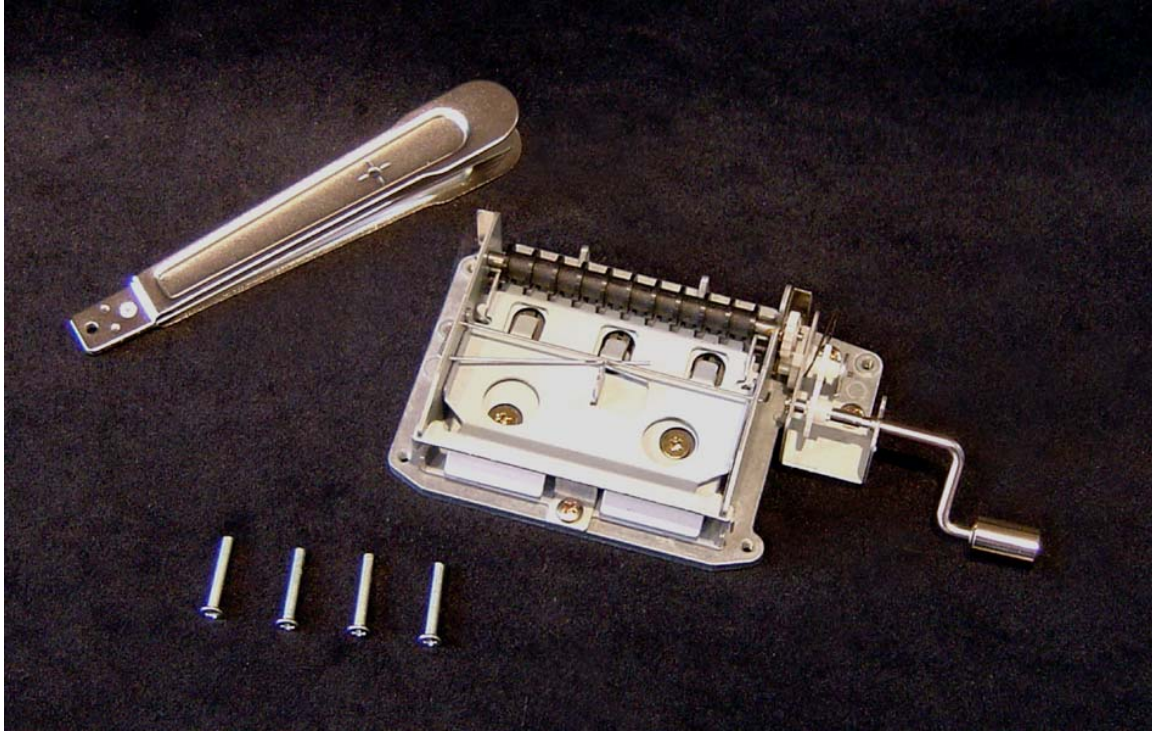


HAND-CRANK MUSIC BOX MOVEMENT



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PARTS LIST

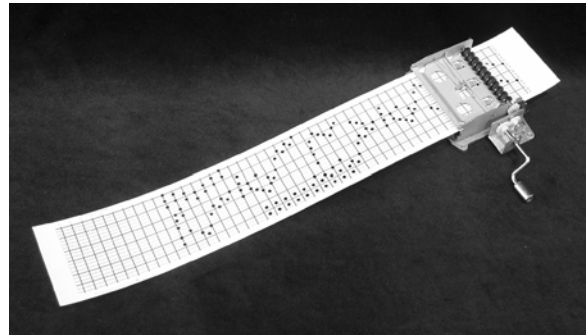
Musical Movement
4 Mounting Screws, M3 X 20mm
Hole Punch
1 Pre-Punched Music Strip (heavy paper)
5 Un-Punched Music Strips (heavy paper)
3 Sample Song Arrangements (plain paper)
4 Rubber Feet, with screws
1/4" Plywood Platform, 3" X 4-1/2"
Kit Instructions



PREPARING THE BOX

____1) Please check over the parts of this kit to make sure you received everything listed. Test the operation of the movement using the pre-punched strip enclosed. With the crank handle at your right, insert the strip into the slot facing you. The song starts where the title is printed. Feed the strip all the way into the slot as you turn the crank clockwise.

DO NOT TRY TO PULL THE PAPER STRIP OUT. Just keep turning the crank to feed it all the way through. The crank only works one direction (clockwise) – it does not work in reverse.



____2) You may use the musical movement without a box, but it will sound best when mounted into an enclosed container of some sort. You might make a box of your own or adapt an existing box or compartment of some other piece of furniture or toy for mounting the movement. You could, for example, mount it into a doll house, a cigar box, the drawer of a cabinet, a building in your miniature Christmas Village, a crèche, etc. Do not try to put it into a stuffed animal though – the movement cannot be wrapped in fabric and stuffing!

____3) If your box is not already pre-drilled for the movement, use the paper templates at the end of these instructions for preparing your box for mounting the movement.

____4) If you are using a cigar box and want to cover over the tobacco company decorations, we recommend a decoupage system. You can paste all sorts of fun things onto the box to create an artistic piece or to establish a theme for the musical strips you intend to punch. Take a look at the color photos on the back page of these instructions for the “before” and “after” shots of a cigar box we decorated.

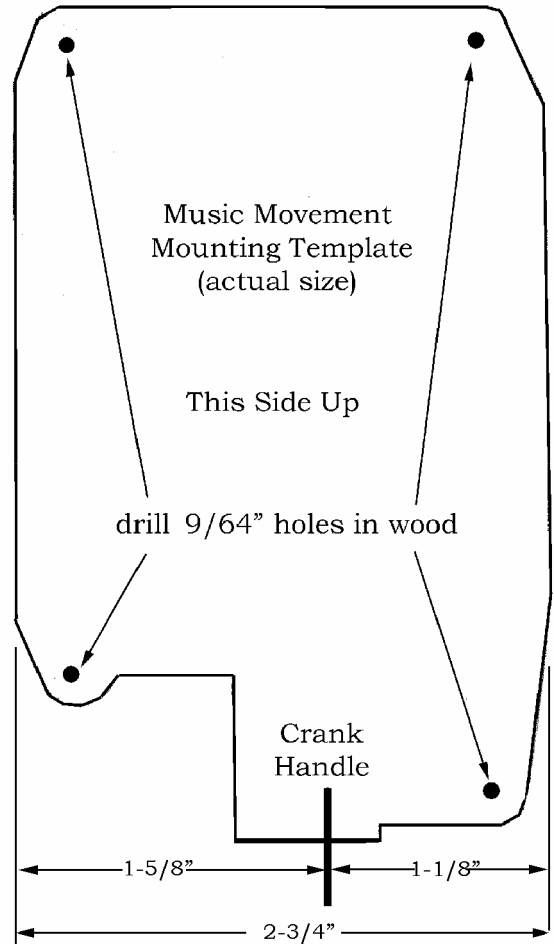
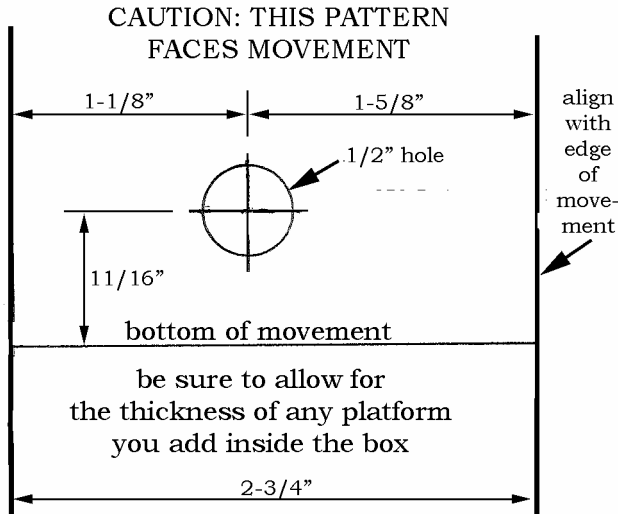
Start by peeling off as many of the paper labels as you can so the surface to be decorated won't peel or blister later. Some cigar boxes will look great as just plain wood. A little sanding and light varnishing might give you a very nice looking box. Once you get the old labels off, you can decide whether to keep the box natural or add decorations.

Decoupage is very easy. If you have not tried it, we recommend searching the Internet for ideas and instructions. When we Googled the word “decoupage”, we found all sorts of great information. It is worth watching some YouTube video demonstrations to see how the experts do it. You'll be able to find all the materials you need at an art supply or craft store (like Michael's).

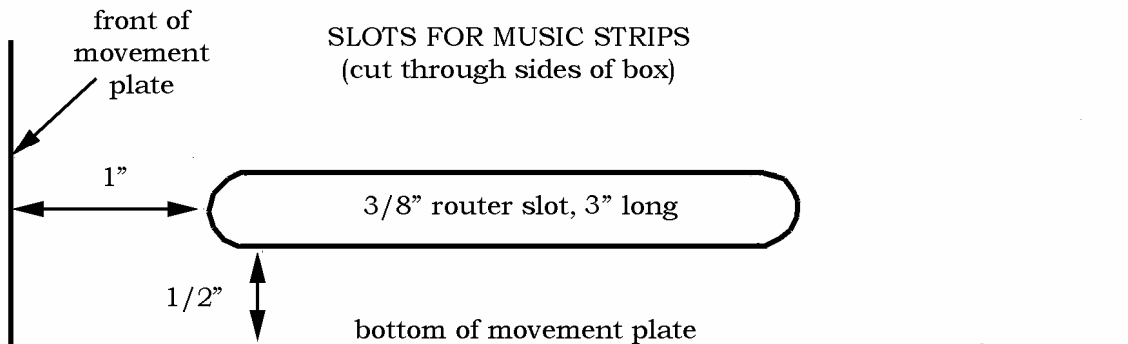
Painting is another good option for decorating. You can use acrylic artist paints or even a latex indoor house paint in flat or satin sheen as a good base coat, and then you can either add stickers, stamps, photos, beads, or other decorations around the box as desired.

Use the following templates for preparing the space for the movement.

Use this template inside the box to locate the hole for the crank handle. We drill $\frac{1}{2}$ " diameter hole here so we can fit the handle through the box.

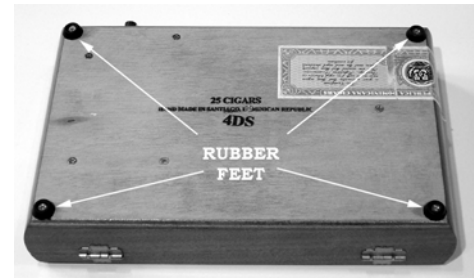


HINT: When using the paper templates for locating the hole for the crank and the slots for the music strips, you might find it easier to place the paper patterns on the outside of the box. To do this accurately, you'll need to measure the distance from the outside corner of the box to the edge of the movement and from the bottom of the box to the bottom of the movement. Add those measurements to the drawing to show new boundaries for the template. Cut the paper on those new lines. Remember, however, to face the template toward the movement (yes, you'll need to trace the positions on the back side of the paper).



You can cut this page out and use the patterns as templates. Hold the paper up against a window (facing out) if you need to trace the patterns to the backside of the paper to reverse the templates.

____5) We recommend adding four rubber feet to the bottom of the box. This lifts the bottom off the table so it vibrates better, and the rubber pads keep the box from sliding as you turn the crank of the musical movement. If the screws for the feet are so long that they might poke through the bottom of the box, you can glue the rubber pads in place with Superglue or 5-minute epoxy.



____6) Sometimes we add a knob to the lid for a handle, depending on what sort of lid the box has. A large bead or colored marble might make a nice knob (use Superglue to hold it in place), or you could look for something at a craft store that suits your fancy.



____7) The paper music strips can be loosely coiled for storage. If you have a flat shelf to keep them safely, that would work well too, but you will likely end up with strips of various lengths, so we find them easier to store in a coil about 4-6 inches in diameter. When you feed the paper into the movement, you may need to reverse the curl to make sure the strip finds its way through the slot on the other side of the box.

____8) If you plan to design and build your own wooden box, you might think about making it large enough to store the paper punch and the coiled music strips inside. We made one box long enough so we could put the movement at one end and store the long paper strips beside it in the box. Then we only need an entry slot for the music strips because they stack themselves nicely inside when they are done being played.



PUNCHING THE PAPER STRIPS

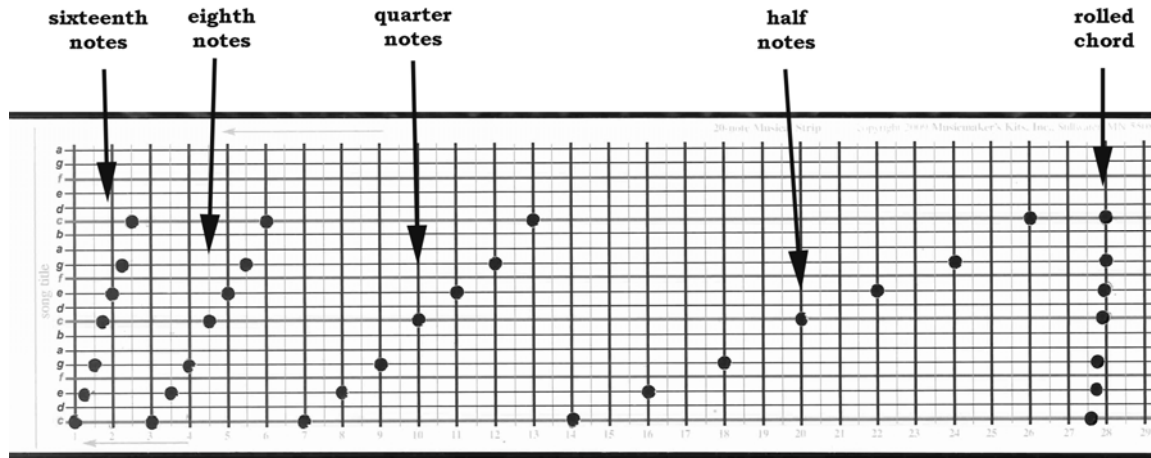
____9) Punching songs in the paper strips will be difficult for non-musical people, and a fun challenge for a seasoned musician. We think it would be a wonderful exercise for a music student because it requires you to deal with both notation and rhythm, and it allows you to be creative with harmonies, grace notes, and other variations. Here are some hints:

A) First, and most importantly, you CAN make corrections to the paper strips!

- You can fill a punched hole with one of your punches by simply taping it back into place, putting tape on both sides (Scotch invisible tape is best).
- You can cut the paper strip apart and splice in another section, using tape on both sides of the seams. We forgot a pause in the middle of one piece, so we simply spliced in a short blank section where the pause needed to be.
- You can add more length to the strip in the same way, creating a very long song sheet if you like.

B) Always mark your paper strip in pencil so you can erase mistakes.

C) You will usually consider every dark vertical line to be a quarter note. That makes the light vertical lines eighth notes and the spaces between lines sixteenth notes. A half note will span two dark lines (or the equivalent distance).



D) It is best to plan your punching carefully. If you are copying from a songbook or piece of sheet music, number all the measures on the music first, and then place numbers on your paper strip to mark the measures. Otherwise you will likely lose track of the beat.

- For 2/4 time, number the measures on every other dark line of the paper strip
- For 3/4 time, number the measures on every third dark line.
- For 4/4 time, number the measures on every fourth dark line.
- For 6/8 time, number the measures on every sixth dark line

E) All “C” notes are red, and “F” notes are blue. We use these colors because they match the colored strings on a harp. It is quite easy to find your way up and down the scale using these colors as markers.*

F) The bottom red horizontal line is the C in the bass clef, one octave below Middle C. The next red line up from the bottom is Middle C, and the next one is the C in the treble clef, one octave above Middle C.

***NOTE:** This musical movement only plays the C major scale. It has no sharps or flats. If you need to copy a song from sheet music in a different key, you’ll need to transpose the notes to the key of C. Though we cannot teach that skill in these kit instructions, you can either consult a seasoned musician for assistance, or go on-line and learn how to do it by reading tutorials (search Google for the words “transpose keys”).

Sometimes you’ll encounter a song in the key of C that has what is called an “accidental note”, which is a sharp or flat that does not belong to that key, you can often just punch a harmony note in place of the accidental and people will not notice that you have altered the melody. Again, a seasoned musician can help you understand this tactic and make suggestions for a suitable alternate note.

Please realize that some music will be impossible to play on this movement. Complex jazz and Classical pieces simply have too many accidental notes to allow you to capture the essence of the music without having sharps and flats. There is, however, an extensive variety of music that will work very well for your music box.

G) Begin with the basic melody. We like to mark and punch the melody line first and try it in the movement before proceeding with harmonies and embellishments. Be sure to center each punch on a horizontal line. Otherwise the note will not play.

H) **CAUTION:** Each note can only be repeated as often as the distance between two dark lines on the paper strip. This is because the cog wheel needs to move that far before it can engage another hole. So if you have a song that repeats a note more frequently, such as several eighth notes in a row on the same note, you will need to improvise. Notice how we did this in the song, "Row your Boat". Where the melody would have multiple notes for the phrase, "merrily, merrily, merrily, merrily", we just put a quarter note at each position.**

I) If your melody line needs to go higher or lower than the range available on the paper strip, you can usually just shift one octave up or down to maintain the integrity of the song.

J) Once the melody is punched and tested, you can add harmonies, grace notes, full chords, rolled chords, and other embellishments to suit your fancy. It can be fun to see how complex and rich the arrangement can be. We often start simply and build to a big climax at the end.***

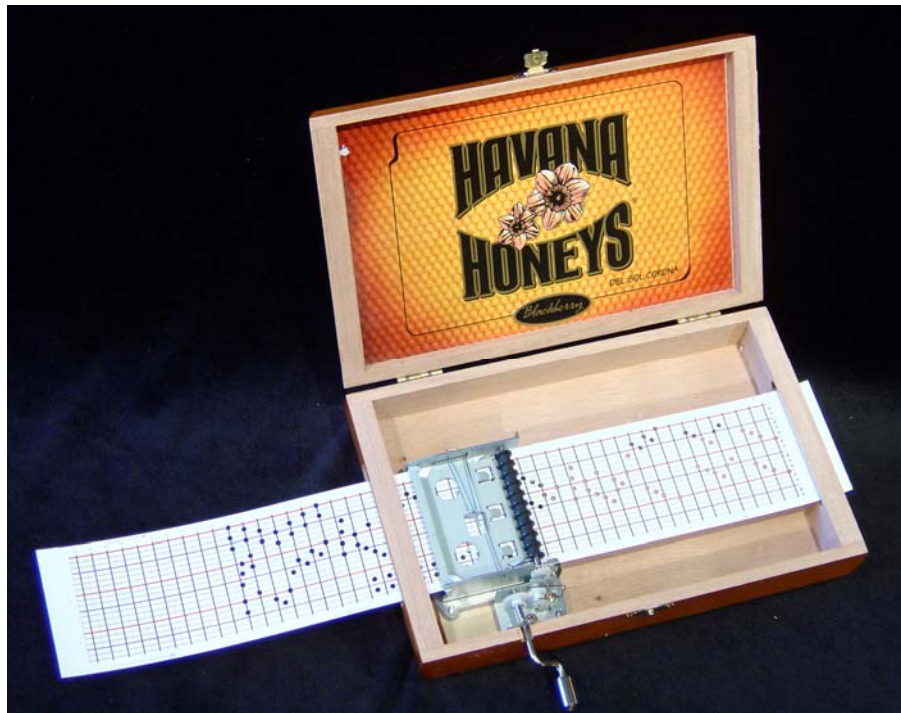
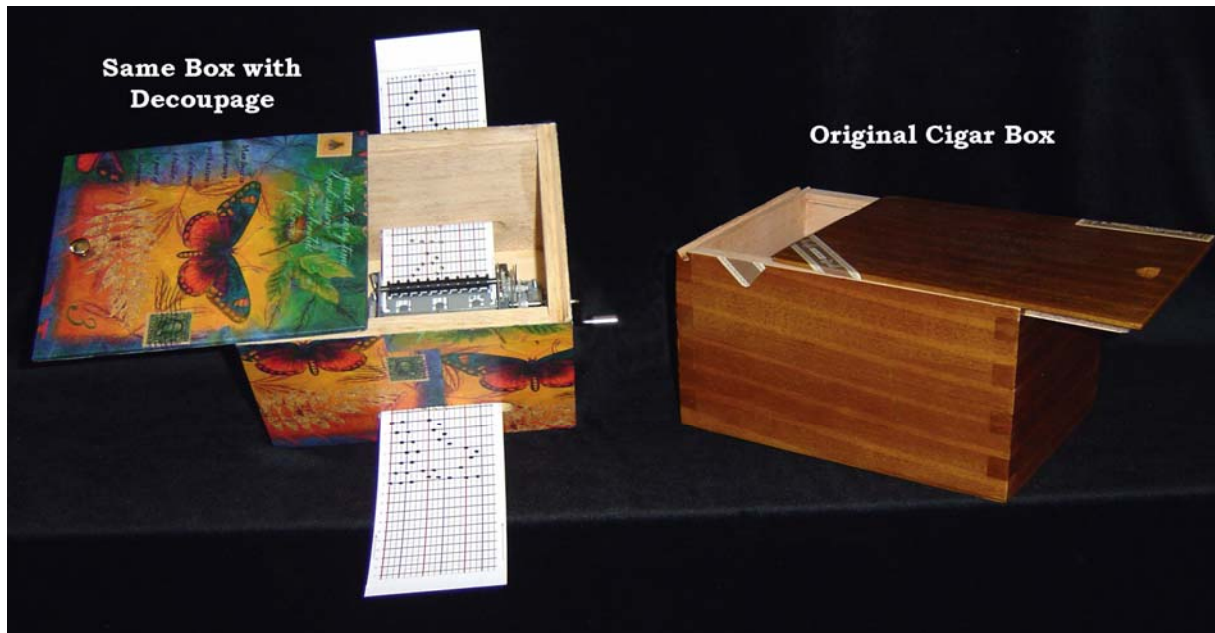
Row Your Boat

JHB

The image displays a musical score for the song "Row Your Boat" in 2/4 time. The score is written for piano, with a treble clef and a key signature of one flat (B-flat). The melody is shown in the treble clef, and the bass line is in the bass clef. The score is divided into ten measures, numbered 1 through 10. Below the score is a pitch contour graph on a grid. The vertical axis is labeled "pitch" and has lines labeled a, g, f, e, d, c, b, a, g, f, e, d, c. The horizontal axis is labeled "time" and has lines numbered 1 through 25. The graph shows the pitch of the melody line for each measure, with dots representing the notes and lines connecting them. The graph is titled "Row Your Boat" and "song title".

****SUGGESTION:** Another way to get around this limitation is to punch the quick succession of notes on different pitches, using neighboring notes or notes that harmonize with the main note. That way you keep the rhythmic pattern of the song by adapting the melody line slightly

*****ANOTHER SUGGESTION:** A great way to get started is to choose a melody that works as a round. "Row Your Boat" is the example above. Other good rounds are "White Coral Bells", "Frere Jacques (Brother John)", "Alouette", etc.



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