

## Guide to piano preparations + extended techniques

***Before engaging in any work or project requiring specialized techniques or preparations inside a College of Music piano, please consult our piano technicians for permission and guidance.***

If you're planning to compose or perform a piano piece that involves reaching inside the instrument or adding preparations to the strings, familiarize yourself with where those techniques/preparations will be used with respect to the layout of the strings inside the piano. Different manufacturers and sizes of instruments have different internal designs: The lengths of the strings, the locations of support struts, the range where the bass strings are strung over the plain wire strings and the accessibility of the strings from the front will vary greatly from instrument to instrument. Due to these design differences, parts of the string available on a specific note on one piano may not necessarily be available on another.

- If you plan to insert any objects, look at where they need to be located along the length of the string and whether that area is accessible.
- If damping/muting strings at the front with your fingers, note the range where the front of the string is accessible on the instrument and whether/where any struts may be in the way.

### Taking care of the instrument

When playing or preparing inside the piano, avoid damaging the instrument or misaligning its parts. A piano has ~10,000 parts, 8,000 of which move when the instrument is being played. For the piano to work properly, the tolerances for aligning these parts are extremely narrow. Some parts are also very fragile, and a few are vulnerable when reaching into the piano or placing objects on/in the strings. The most delicate parts accessible from the top are the **dampers** and the **bass strings**, each of which must be treated very gently.

**Dampers** consist of extremely fragile felt blocks on wooden heads, which individually travel up and down on a thin wire. Because the felt must align perfectly with the strings to stop them from vibrating and avoid extraneous noise, the dampers must travel straight up and down in all axes of movement. It does not take much force to misalign them—even brushing/bumping them by accident, or pressing on them, will very slightly change the relationship between the felt blocks and the strings, often requiring the dampers to be re-regulated.

**Bass strings** have copper windings wrapped around a core steel wire. These windings give it mass and more flexibility while vibrating than a thicker solid wire, allowing it to vibrate at the pitch we want with good tone. If substances get into the windings, it decreases the strings' flexibility and can kill its tone (old pianos develop a characteristic “tubby” bass tone due to dirt, dust and debris accumulating in the bass strings over many years). Copper also reacts to oils in our skin, so merely touching them can darken the strings where they're touched.

## Playing inside the piano

**Be aware that touching any string leaves behind oils from your fingertips.** This is normal and expected, but please take care to keep our instruments clean as a courtesy to all others who use them. Anywhere you touch the strings, once you are finished, wipe them with a small amount of isopropyl alcohol on a microfiber cloth to remove any skin oils. *As also noted above, this is especially important on the bass strings as they will darken and discolor if any skin oils are left on them.*

- Damping/muting involves touching the string at its front termination point, where the speaking length of the string ends. If you damp/mute the bass strings, try to touch only the bare steel portion at the front. If you need to touch the bass strings for an extended period of time, such as moving your fingers across their length, we recommend wearing a cotton glove to keep a barrier between your fingers and the copper.
- Do not use chalk, crayon, Sharpie, pencil or anything that leaves residue to mark harmonic nodes on the bass strings. We recommend using blue painter's tape: Cut thin strips and use tweezers to weave them around the string, forming a ring at the location where you want to mark it. These do not affect vibration if they are sufficiently thin (about 1/8" to 1/4") and are easy to remove without leaving any residue behind. Touch the tape directly instead of the copper.
- If you need to identify specific strings for navigation inside the piano, avoid using stickers with adhesive residue on the dampers. The harder they are to apply or remove, the more likely you will misalign the dampers in the process of applying or removing them. We recommend using Post-It arrow flags (the kind used on contracts to show where to sign) as they have very little adhesive residue and peel off very lightly. We keep some in the shop, if needed.

Regarding objects used to play the strings directly:

- If applying objects with pressure directly on the strings (e.g., George Crumb chisel), always use a material that is softer than the strings to avoid marring or damaging them. In the case of steel strings, any metallic object should be made of brass or another softer metal. We have a chisel with a brass tip that is safe to use on the steel strings, and that can be borrowed for rehearsals and performances. *Note: It is **not** safe to use this on the bass strings.*
- To avoid damaging the soft copper windings, do not use any metal objects on the bass strings.

Only use objects made of felt, rubber, card, yarn, plastic or other materials softer than copper.

- If you have questions about whether a specific object or material called for in a piece is appropriate, please consult with the piano technicians—we're happy to help you!

## Preparations

If you plan to prepare a piano, first consider 1) how the piano is used by the rest of the school and 2) how long it will need to be in a prepared state. Our pianos are shared resources for all students and faculty, and any preparations made to them will mean they can only be used for that purpose while preparations are in place.

As you are preparing, if something falls in where you cannot easily extract it, please let a piano technician know! We are trained to take the instruments apart, and we have tools and techniques for getting objects out without causing damage or preventing the instrument from working properly. When putting objects between the strings, **always** press the right pedal to lift the dampers out of the way. If the dampers rest on the string while it moves left or right, the movement can warp or even tear the felt on the blocks. Additionally, if you choose an object that continues to displace the string once inserted, the dampers may not mute the strings properly and the hammers may not strike all strings squarely. For these reasons, when choosing preparation objects, use a width that will not displace the strings very much or at all, whether side-to-side (screws, bolts, washers, etc. fit in between strings) or up and down (strips of material woven over and under the strings).

## Choosing materials

When deciding what objects to place in the piano, use materials that are softer than the strings they will be pressing against in order to avoid damaging them. Regarding screws/bolts:

- Most piano wire is made of steel, so screws/bolts placed between them ideally should be made of brass or another soft metal.
- Choose a width of screw/bolt that avoids displacing the strings very far to the left or right.
- Press down the damper pedal and gently wind the threads through the strings. *Do not shove them in*—the threads are sharp and will damage the strings if they are not handled carefully.
- Leave ample room between the end of the screw/bolt and the soundboard.

Other materials (e.g., felt, rubber, plastic, card, paper) are generally suitable and safe as long as they do not displace the strings greatly. Because the copper bass strings are so much softer than steel strings, only these soft materials are suitable for inserting between them—do not use metal screws/bolts on copper wound bass strings.

Rosined thread is sometimes used for bowing the piano strings. It leaves a residue on the steel strings which must be cleaned off (similar to fingerprint oils). Because it is possible to damage the soundboard when cleaning the underside of the string, we recommend not using rosin; but if it absolutely must be used, we suggest the following:

- *Always seek permission and guidance from the piano technicians regarding choosing a suitable instrument for bowing.* We do not allow it on our concert instruments; other pianos may be possible on a per-case basis.

- Do not use rosin on the bass strings as it will find its way into the windings.
- Any plain wire string where you use rosin must be cleaned with isopropyl alcohol. Put a small amount on a microfiber cloth and use that to rub the strings where rosin has been applied. Cut a strip of cloth and use tweezers to thread it underneath the strings to clean their undersides. *Be careful when doing this: Try to avoid touching the soundboard, as the alcohol will damage its finish.*

Questions? *Get in touch!*

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