

— TUNING CHART —

TREBLE BRIDGES

LEFT	RIGHT
F6	F5
E _b 6	E _b 5
D6	D5
C6	C5
B _b 5	B _b 4
A _b 5	A4 semi-flat ¹
G5	G4
F5	F4
E5-semi-flat ¹	E4 semi-flat ¹

BASS BRIDGES

LEFT
F4
E _b 4
D4 Semi-flat ¹
C4
B _b 3
A3 semi-flat ¹
G3
F3
E3 semi-flat ¹

¹ Semi-flat = Halfway between the natural note and Western Flat

Instrument Care

Here are some simple tips to care for your dulcimer:

- Use a dry soft cloth for dusting
- Avoid extreme temperatures
- Replace broken strings immediately
- Use only Manufacturer recommended strings

Accessories

Dulcimers and accessories are available at www.mid-east.com



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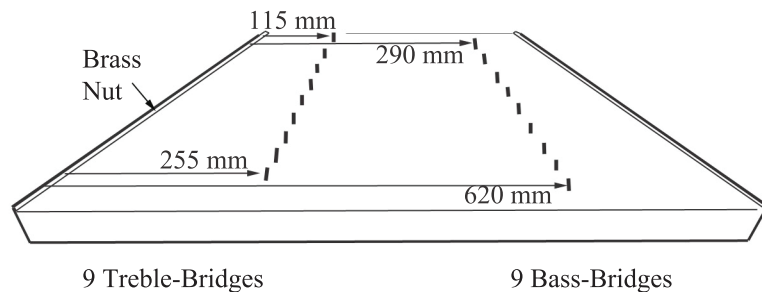
PERSIAN SANTOOR (HAMMERED DULCIMER)



— OWNER'S GUIDE —

Before You Begin

You must set the bridges in the proper positions on the soundboard. The 9 treble-bridges (left side) each support 4 steel strings, the 9 bass-bridges (right side) have bronze strings. To determine their positions, find the brass bar on the left edge of the santoor; this is the nut. The bottom-bass-bridge is 620 mm from the nut and top-bass-bridge 290 mm from the nut. The bottom-treble-bridge is 255 mm from the nut and the top-treble-bridge 115 mm from the nut. Position the remaining bridges in-line with the top and bottom bridges on each side. These approximate locations will be corrected as you tune.



Tuning

Be Patient! The first tuning can take a couple hours and it is not uncommon to break strings. You will be tuning 3 playing fields: left of the treble-bridges, right of the treble-bridges and left of the bass-bridges. The notes range from E3 semi-flat (3rd octave) to F6 (6th octave), where C4 is Middle-C. Refer to the Tuning Chart for the correct notes. Always begin by loosening a string slightly; this ensures you are working on the correct string and equalizes the tension across the string. Then, *SLOWLY* turn the tuning peg while plucking the string. Check the pitch with an electronic tuner.

Start with the longest course of strings over the bottom-treble-bridge. Tune one string at a time, starting on the right side of the bridge. As you tune, slide the bridge back and forth, 1-2 mm, until the note is E4 semi-flat. Then note the same string on the left of the treble-bridge. If the note is too high, move the bridge to the right; if the note is too low move the bridge to the left. Once the string is in tune to E5 semi-flat on the left of the bridge, re-tune the string to the right of the bridge, if possible, without moving the bridge. Tune the next 3 strings in the course in sequence. You may need to swing the top end of the bridge left or right, if you move the bridge you must re-tune the previous strings.

Next, tune the highest (shortest) course of strings over the treble-bridge in the same manner, until the note to the left and right of the bridge is F. Once you have these notes, you can tune the rest of the strings on the treble-bridges. Alternating from top to bottom as you move to the middle bridge helps keep the tension balanced. Lastly, tune the bass bronze strings only on the left side of the bass-bridges.

Tuning Tips

- Over tightened strings are difficult to tune, and can break. If you can't get the note you need, back off the tension and try a lower octave.
- To maintain uniform tension, tune strings from flat to on-pitch, never from sharp to on-pitch. If the string is not uniformly tensioned, it will ultimately be drawn out of tune.
- If the tension to the left and right of the bridge is not equalizing, use your fingers to slide the string up or down, just a hair, over the bridge cap. You can try this on the side rails too.

(See Tuning Chart on Back)