

How to refret a theorbo

Theorbos seem to require more frequent fretting adjustments than other kinds of lute, probably because the bass strings all pull on one side of the neck, plus the tension on the neck extension is constantly being altered as we retune our basses for different keys. Refretting a theorbo is not difficult; you can use the instructions below for any kind of lute - they are not theorbo-specific. However, you will need more space for manoeuvring a theorbo than other kinds of lute require.

You will need:

- * Nail clippers or small scissors. Clippers are best.
- * A cigarette lighter, preferably one with an adjustable flame.
- * Fret gut in a full range of gauges, in 0.05mm increments. Your theorbo may have come with a list of its fret sizes. If so, buy these gauges, plus any in between (e.g., if you have frets of 0.8mm and 0.9mm, buy a length of 0.85mm too, because theorbos move), plus one or two sizes larger and smaller than the extremes on your fret list. All gut string suppliers also sell fret gut, as do most stockists of nylon lute strings.
- * Pencil and paper, to write down gauges as you go.

If you are simply replacing worn frets of known size, which normally give a buzz-free action on a stable instrument, your task is simple. Start at the 1st fret, and work up the fretboard one fret at a time. You may only need to replace the more frequently used lower frets. The following instructions assume this is the case.

For each fret proceed as follows:

Take a length of fret gut of the appropriate gauge. Tie a simple over-and-through knot (round turn and half hitch) about 1cm from one end. Burn the short end until it melts into a blob.

With the theorbo face-up on your lap, its neck on your left (if you're right-handed), pass the other, unknotted end of your fret gut under the theorbo's stopped strings, from treble to bass. Flip the theorbo over, so it is now face-down on your lap, still with its neck on your left.

Find the ends of the fret gut, pass the unknotted end through the loop of the knot, and pull all of the extra length through the knot.

As you tighten the fret steer it a) to the root of the neck extension, so that you are tying it as far back as possible from its eventual position, and b) steer the knot to the extreme edge of the neck on the bass side. Take a good grip on the leftover length of gut and pull the knot tight. If you pull in the direction of the bass edge of the neck, the

knot should 'run' right to the burned blob, which should end up sitting on the extreme edge of the neck, ideally on the millimetre or two of hardwood which is the fingerboard edge.

When the knot and the fret are tight, and the knot is lying nicely on the edge of the neck, clip off the excess length, leaving about 7-8mm projecting from the knot. Carefully pull the diapasons aside, and apply a lighter flame to the projecting end of fret gut. It will gradually burn down into a blob, merging with the first blob you burnt. This seals the fret. Ease the diapasons back into position.

Turn the theorbo face up again (or stand it on the floor in front of you, soundboard facing you). With the nail clippers, cut away the old fret. Ease the new fret up the fingerboard into the place of the old fret - which has probably left a convenient shiny line across the fingerboard.

Voilà! Pluck each open string firmly to check for buzzes. Check the new fret is tight. Put the remaining length of fret gut back into the correct packet, unless you are going to use it again for the next fret.

Repeat for subsequent frets, being careful to select the correct gauge in each case. Obviously only the first fret will need to be tied at the very end of the neck. For the other frets, tying them one fret down from their final position will usually suffice. The taper on the neck provides the final tightening as the fret is moved to its final position.

Complications...

If you are replacing worn but basically functioning frets of unknown size: you simply need to measure them and duplicate the sizes, then proceed exactly as above. Comparing gauges by eye may not be sufficiently accurate, and you will need either a micrometer or a vernier caliper to measure the gut. (See below for sources of these.) Be careful to measure unworn parts of your old frets.

If your current fretting is buzzing, and you are attempting to remove the buzzes through changing the fret sizes, this can be more complicated:

If your theorbo has wooden body frets, and these are functioning well, I suggest that you start with the highest tied fret. Try the smallest tied fret possible, and make sure that it creates no buzzes with your lowest wooden fret. If it buzzes go up a gauge and try again, until you find the smallest buzz-free fret size. Try duplicating this size for the next tied from down the neck. If that buzzes, go up one gauge and try again. If that still buzzes go up another gauge, until you find the smallest gauge which works there. Repeat that procedure for each fret, aiming in the first instance to duplicate a fret size, or to increase the size as little as possible, as you proceed towards the nut. Ideally we want to have plenty of sizes in hand (and therefore plenty of room to manoeuvre) when we get to the most critical lower frets.

If your theorbo has no wooden body frets, I suggest that you start at the nut, with the first fret. Put on the largest size of fret gut that you can get away with, without the open strings buzzing. Try duplicating this gauge on the second fret. If it buzzes, go down a gauge and try again, until you have the largest possible second fret. Repeat this procedure at each fret. We are aiming to decrease each fret size as little as possible as we proceed towards the body. There will inevitably come a point where the amplitude of the strings demands a steeper fretting gradation, but for some of the neck it is usually possible to duplicate gauges over two or more consecutive frets. Make sure that you write down the final fret gauges as you go, and that you return each piece of gut to the correct packet, otherwise this can be a frustrating and rather expensive business!

If one string consistently buzzes, where adjacent or thicker strings do not, try pulling that string up at the bridge. This will usually solve minor buzzing problems.

Where to find micrometers, vernier calipers, etc

Old-fashioned metal micrometers (often measuring in imperial thousandths of an inch) can frequently be bought in flea markets and junk shops very cheaply, and are perfectly adequate for comparison measurements, even though fret gut sizes are metric. A good tool shop or DIY store may stock a basic micrometer or vernier caliper. Several companies specializing in precision engineering instruments make various kinds of micrometer and also vernier calipers, but these are mostly unnecessarily sophisticated and expensive for our needs. The most basic micrometer, or a plastic or fibreglass vernier caliper is perfectly adequate for measuring fret gut to within 1/10th mm. Try www.mitutoyo.co.uk or www.mitutoyo.com for a range of precision instruments (many of them very expensive!) or www.tooled-up.com for a good range of cheaper alternatives.

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