

Tuning the Great Highland Bagpipe

From the chanter reed to the drones – step by step

Anyone who takes up the Great Highland Bagpipe soon finds out that playing is one thing and tuning is quite another. The internet is full of individual tips, but there is hardly a guide that describes the whole process in one piece – from preparing the chanter reed to a fully tuned set of drones. This guide is meant to close that gap.

1. Before you start

Tuning only works on an instrument that is in good order. The bag must be airtight, all joints properly hemped and the reeds correctly seated. If the pipes lose air somewhere, you will end up chasing a fault that has nothing to do with the reeds.

The most important requirement, though, is you: a steady, even blowing pressure. If the pressure wavers, the pitch wavers too – and nothing can be set properly. Play the pipes for a few minutes before tuning. Warmth and moisture change the pitch, and most of that happens in the first few minutes.

An electronic tuner or tuning app can help, especially at the beginning. Calibrate it to the Low A of your own chanter. In the end, however, it is your ear that counts – and your ear can be trained.

2. Which reeds there are

Before we get to the reeds, one important distinction. A reed is not just a reed – depending on where it sits and what it is made of, it is treated quite differently. Mixing them up can, at worst, ruin a good reed.

- The pipe chanter reed is a double reed: two blades made of giant cane, tied onto a small metal tube (the staple). It lives on the right amount of moisture and can be worked on within limits. Sections 3 to 5 are about this reed.
- Drone reeds are single reeds with a vibrating tongue. Today most are synthetic, with a rubber bridle and a tuning screw. There are also – less common – cane drone reeds with a bridle of waxed hemp. The two types are adjusted differently – see section 7.
- The reed of the practice chanter (PC) is usually plastic, less often cane. It sits under the cap of the PC and has nothing to do with tuning the pipes.

What cane is

Where this guide speaks of cane reeds, it means one particular material: giant cane (also called Spanish cane, botanically *Arundo donax*). It is not wood, but a tall, reed-like grass. The same material is used for

the reeds of the oboe, clarinet, bassoon and saxophone. Cane for reeds comes mainly from particular growing areas in Spain and France.

A word on the practice chanter (PC) reed

A plastic reed does not absorb moisture and cannot be sanded or changed by moistening. Its pitch can hardly be influenced by blowing pressure either. Moisture does, however, get into the binding more easily, so it is worth taking the cap off after practice and letting everything dry. If the blades no longer close properly, a small elastic band can help. A cane PC reed, on the other hand, can be worked on much like a chanter reed – scraping, gentle squeezing, moistening.

3. Preparing the chanter reed

Moisture

The cane a chanter reed is made from is very sensitive to moisture. Too dry, and it sounds thin and sharp. Too wet, and it sounds dull and flat. Licking the reed or dipping it in water before playing tends to do more harm than good, because it shocks the reed with moisture. It is better to keep the reed evenly moist, for example in a reed case with a humidity control.

A new reed, or one that has not been played for a while, can be blown through the open end of the staple for a few minutes so that the cane takes up moisture again and responds better. A new reed keeps changing for the first week or two until it is broken in. That is why you choose it slightly stronger than feels comfortable, because it gets easier while breaking in. Always handle it by the staple, never by the blades.

The crow test

Before the reed goes into the chanter, test it by mouth. Take the reed between your lips, blades first, and blow. A good reed first gives a slightly scratchy, buzzing sound – pipers call this the “crow”. Blow a little harder and it turns into a clear, stable tone.

That sequence is the good sign: crow first, then a clean tone. If the reed only gives a high-pitched squeal without that transition, it needs adjusting. The crow also tells you something about the sound to come: a brighter, higher crow suggests a brighter sound in the chanter.

Too hard or too easy?

A reed that is too hard takes a lot of effort and is difficult to hold steady. The gentlest remedy is an elastic band (bridle) placed low on the reed, doubled or tripled if necessary – no higher than about a third of the way up. It presses the blades together slightly and makes the reed easier. The advantage: it can be undone at any time.

A reed that is too easy or worn out sounds sharp and thin, chirps on grace notes or squeals. The cane has softened over time. A reed mandrel can be used to open the reed carefully from the inside – this makes it a little stronger again, clearer and more stable.

Some reed makers recommend squeezing a hard reed very gently – at the sound box, just above the staple, never on the blades. This makes the reed easier and slightly sharper and can steady an unstable F. Others advise against it, because the reed can be damaged and become unstable. I would always try the elastic band first and squeeze only very carefully.

4. Working the reed with sandpaper

If the elastic band does not help, the blades can be thinned. This makes the reed easier and lowers the high notes slightly in relation to the low ones. Use very fine sandpaper or a sharp knife, with little pressure and in small steps.

Proceed with the utmost care! What is gone is gone: material taken off cannot be put back, and the reed would be ruined. Ideally, have a teacher who knows how to do it show you the whole process first.

- Start at the tips of the blades and work slowly towards the middle.
- Do not make the centre of the blades too thin – otherwise F becomes unstable and High A tends to crow in the chanter.
- Put the reed back in and try it after every step.

If High A crows in the chanter, a very light sanding often helps: either the outer edges of the tip at an angle of about 45 degrees, or draw the end of the reed across very fine paper (800 grit) for about 2 cm.

Cutting 0.25 to 0.5 mm off the tip makes the reed harder and sharper and steadies the F. The blades then usually need thinning again. This is work for experienced pipers.

5. Tuning the chanter

The octave Low A – High A

Chanter tuning always starts with Low A. It is the keynote to which the drones will later be tuned as well. First check that Low A and High A form a true octave – the same note, one octave higher.

This is set by the position of the reed in the reed seat. Moving the reed affects the high notes more than the low ones, because the air column is shorter there:

- Push the reed deeper into the seat: all notes go sharper, the high ones more than the low ones. Helps when High A is flat. Set too deep, High A starts to crow and F becomes unstable.
- Pull the reed out a little: all notes go flatter, the high ones most of all. Helps when High A is sharp, and calms a crowing High A and an unstable F.

Then do the same check with Low G and High G.

The individual notes

Only when the octaves are right do the other notes come in. Play the scale slowly, upwards from Low A, and listen to each note against the drones. If a note sounds unsettled or “wobbles”, it is out of tune.

A sharp note can be flattened with tape: partly cover the hole that produces this note – the highest open hole – from its upper edge. This effectively moves the hole downwards, and the note drops. D and F most often need some tape. Low G can be flattened with tape over the sound holes at the bottom of the chanter – but this also affects Low A and the other notes.

A flat note cannot be raised with tape. That is a job for an experienced piper or pipe maker.

6. Tuning the drones

All three drones are tuned to the Low A of the chanter: the two tenor drones one octave lower, the bass two octaves lower. The aim is not three notes side by side, but one single, steady sound.

What you listen for is the beating: two notes that are almost, but not quite, the same produce a rhythmic wobble. The closer you get to the right point, the slower it becomes – until it disappears altogether.

As for direction: sliding the top section of a drone up the tuning pin makes the drone longer and therefore flatter. Sliding it down makes it shorter and sharper.

First the drones on their own

At the beginning it is easier to tune the drones without the chanter. Remove the chanter and cork the chanter stock, and cork the top of the bass as well.

1. Set the outside tenor so that one or two wraps of hemp are still visible on the tuning pin. Set the inside tenor high up on its pin.
2. Fill the bag and blow steadily. You will hear the two tenors beating against each other.
3. Slowly slide the inside tenor down until the beating disappears and both tenors sound as one.
4. Take the cork out of the bass and put it in the middle tenor. Set the bass top section to one or two visible wraps of hemp, and the bass middle section about one centimetre above the bottom of its pin.
5. Blow steadily again and slowly slide the bass middle section up until the beating disappears.

Then with the chanter

1. Put the chanter in, play Low A and tune the outside tenor to the chanter.
2. A proven trick: blow a little harder for a moment. If it sounds better, move the drone up a little. If it sounds better when blowing softer, move the drone down a little.
3. Then play High A – just for a steady airflow – and listen to the drones, not the chanter. Adjust the bass until it blends with the tenor into one sound.
4. Tune the middle tenor in the same way.

For practice: deliberately move a drone past the right point until the beating returns, then come back. This trains your ear to find the point. Five to ten minutes of tuning practice a day make a noticeable difference.

Guideline: when in tune, the top section of a tenor drone should sit roughly between the hemp line and about 9 mm above it; the bass at about the hemp line. If the tuning point is well outside this range, the drone reed itself should be adjusted – see the next section.

7. Setting up the drone reeds

This depends on which drone reeds you play. Synthetic reeds and cane reeds look similar, but they are adjusted and cared for differently. Some things apply to both.

For both types: a firm seat and the right strength

Each drone reed must sit straight and in line with the bore in the reed seat – firm and airtight. This is controlled with waxed hemp on the reed: add or remove until the reed sits securely. A little soft wax on the taper helps with sealing. A loose reed loses air and, at worst, can fall into the bag.

Then check each drone on its own, with the others corked, and increase the blowing pressure slowly. A correctly set drone reed uses as little air as possible and only shuts off just before your strongest blowing pressure.

- If it shuts off earlier, squeals or hardly strikes in: it is too easy.
- If it does not shut off at all and uses a lot of air: it is too hard.
- If it tips into a buzzing “rrrr” at low pressure (double-toning), it needs less air to strike in.

The tongue of a drone reed is fixed at one end and vibrates freely at the other. Look at your reed closely before moving anything – the direction depends on it.

Synthetic drone reeds

Most pipers today play synthetic drone reeds, usually with a tongue of plastic or carbon. The bridle here is a rubber ring, and there is a tuning screw for the pitch. Each has its own job:

- Rubber bridle towards the free end of the tongue: the reed needs less air, strikes in at lower pressure and goes slightly sharper. This helps against double-toning and when the reed is too hard.
- Rubber bridle towards the fixed end of the tongue: the reed becomes stronger, needs more air and goes slightly flatter. This helps when it shuts off too early or squeals.
- Tuning screw: changes only the pitch. Screwing in makes it sharper, screwing out flatter. Use it to bring the drone's tuning point to the right place on the tuning pin. Designs differ between makers – if in doubt, read the maker's instructions.

Move the rubber bridle only in very small steps, about half a millimetre to one millimetre, and check the drone on its own after each step. The setting is very sensitive. Synthetic reeds like to be dry: moisture is more of a nuisance for them, so a moisture control system in the bag belongs with them. Avoid touching the tongue and the bridle in everyday use.

Drone reeds (cane)

Cane drone reeds have become less common, but are still played for their sound. Here the tongue is cut directly from the cane, and the bridle is a binding of waxed hemp. There is usually no tuning screw.

- Wax the bridle with cobbler's wax or a similarly tacky wax – beeswax and pre-waxed hemp tend to slip.
- The tension of the bridle matters: tied too tight, the reed squeals or shuts off. Too slack, it sounds unsteady and dull.
- The reed goes sharper if you set it deeper into the drone or move the bridle towards the closed, waxed end of the reed.
- It goes flatter if you pull it further out, move the bridle towards the drone, or weight the tongue with a little sealing wax or tape.

Unlike synthetic reeds, cane reeds like a certain amount of moisture, much like the chanter reed. A new cane reed also needs time to blow in before it finds its sound. Never flick the tongue up and let it snap back – this damages the fibres.

Strength and tuning point together

Strength and tuning position affect each other. That is why you adjust both in turn, in ever smaller steps, until the tuning point is in the right place and the strength suits your blowing pressure. Before adjusting anything, rule out moisture as the cause.

8. If it still does not work

The most common causes are rarely the reeds themselves, but a leaking bag, an unsteady blowing pressure or reeds that are too wet. In that case, go back to the beginning once more. And do not be discouraged: nobody learns to tune in a day. With a little patience, three drones and a chanter become one sound.