



# The Wessel Flute Ferret

## *Instructions*

**PLEASE READ IN FULL BEFORE USE**

*Follow the diagrams at the back*

### Introduction

The Flute Ferret is a highly sensitive instrument for use by flute makers and repairers. The probe will accommodate itself to irregularities of bore while the applied air pressure is extremely low. Leaks show up instantly and unequivocally. With practice the Ferret is very quick to use and will provide a useful indication of the type of leak and its severity.

There is no need for a source of power such as a battery. The air pressure is supplied by you!

The Flute Ferret consists of two main parts: the **Probe** which goes inside the flute, and the leak **Indicator**, which is a water manometer for measuring small pressure differences. The two are connected together by a length of flexible tubing.

The Indicator is designed to sit on the bench but it could be dangled from a hook using a piece of string. Plug in the 3 steel legs.

### For UK mainland customers only.

The Indicator has already been filled with coloured water which should occupy the lower halves of the two tubes in a continuous **U**.

If during transit the water appears to have been disturbed or migrated to the upper end hold the gauge vertically and tap the back gently until the water settles at the bottom. Tap until the last drops have joined the bulk.

Now remove the small black piece of tubing which connects the two outlets. This acts as a block to deter the water from moving around during travel. If you intend to take your Flute Ferret around then keep it for reuse. Connect one of the long pieces of tubing to either one of the outlets. Do this carefully to avoid nicking the rubber. You may need to top up after a few years or so.

### Filling Indicator for the first time and topping up.

It is not possible to send the Indicator overseas already filled with water. So you have to fill it yourself, which is very easy.

Measure out approximately 50ml of clean, soft or distilled water. Add a few drops of "Rinse Aid" (used in dishwashers) You can also add a very little fountain pen ink or food dye to provide colour. Remove one of the screw plugs. Fill the loose syringe with 3.5ml, push the flexible tube well down into the indicator and inject the water slowly. Replace the plug tightly. Now check the levels in each arm are the same. If not, just tap the Indicator until the levels settle down. Don't worry if there are bubbles or globs of water; they will disappear during the next stage. Connect one of the loose flexible tubes to either one of the outlets. Do this carefully.

## Practising

**Place the end of this tube in your mouth, watch the indicator and suck very gently.** As you suck, the water columns will move. Practise moving them up and down by alternate sucking and blowing but be sure to go gently: too much pressure and the water will go over the top into the flexible tubing. Note that when you stop, the water levels return to equal height. If they do not it means there is a drop of water trapped in one of the top connectors. A bit more sucking or blowing should remove it. (See below). Finally connect the other flexible tube to the Probe and the indicator.

**Your Flute Ferret is now ready for use.**

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## Using

Wipe through the inside of the flute body.

Check that the black knurled knob is loose. It should be backed away from the business end of the probe but not tight against its stop.

Holding the flute in the left hand push the Probe into it until it straddles a tone hole. *The white band on the side of the Probe must be visible under the key but the small hole can be randomly oriented.*

Now pulling the knob sideways a little towards your body, screw it inwards towards the probe until tight. This action will squeeze the rubber bung into making an airtight seal and lock it in place. If you do not pull it sideways first, the bung itself will tend to rotate and remain loose.

If the probe seems sticky and hard to push rub a little talcum powder on it and blow off any excess.

**Once the Probe is locked in position do the following in the correct order:**

- Put the end of the flexible tube which goes to the Indicator in your mouth and suck gently as before while watching the Indicator.
- When the water levels have changed by about 3" (75mm) close the flute key using normal finger pressure and stop sucking.
- You can keep the tube in your mouth but do not block the end with your tongue. This process will apply a small *positive* pressure under the pad that is being tested. If it is 100% air-tight the water levels will remain stationary. If on the other hand the levels quickly return to zero (equal) there is a serious leak. *The rate at which the levels change is a measure of the size of the leak.*
- For normally closed keys like the Eb and trills, open the key first, then suck, allow the key to close and stop sucking. NB. The closed G# can only be tested at the same time as the duplicate G# as the two holes are opposite. An indicated leak here may come from either.

It is possible with practice to learn a lot about the type of leak and even its approximate position on the pad. Remember that with open-hole keys the seal between finger and key is being tested at the same time as that between pad and tone hole. To eliminate confusion it is best to cover the key hole with a small piece of sticky insulation tape which will ensure a perfect seal under the finger. Make sure the tape is clean and fully stuck down all the way around.

Applying greater finger pressure will often stop a leak but players do not want to do this, so only the lightest touch should be used, as though playing.

### Types of leak

1. If by applying slightly more finger pressure the leak stops completely, it means that either the pad is not quite level or, where it is connected to another non-fingered key, that clutch adjustment is needed. A feeler gauge should then be used to discover the exact whereabouts of the leak.
2. If a lot more finger pressure is needed it usually means the pad is leaking at the back.
3. If the leak is fairly slow but *constant irrespective of finger pressure*, it usually indicates either a torn pad, or a pinhole, or a speck of grit or hair lying on the tone hole impression. Examination with a strong lens is then required. Pinholes can be hard to spot but can cause large leaks.
4. If in the above case the pad appears clean and undamaged, the leak may be occurring via the pad washer, screw or grommet. Test each of these areas using a cotton bud and water. The water will temporarily block the leak. Pathways for air to leak around the pad seating are quite common in old flutes that may have damaged cups or grommets. Note that neither feeler gauges nor light sticks can find such leaks.
5. A very rare source of leakage is porosity around a soldered tone hole joint, especially if lead solder has been used.

Is there a rate of leak which can be tolerated? Perfection should always be sought but very small leaks are less troublesome towards the lower end of the flute than at the upper. For instance, a tiny leak under the A# key would colour the whole instrument whereas a slightly leaky low C would probably not be noticed. If you can count 20 seconds or more while the water drops 3" (75mm) then you have a very slow leak that may be acceptable. Anything faster should certainly be fixed.

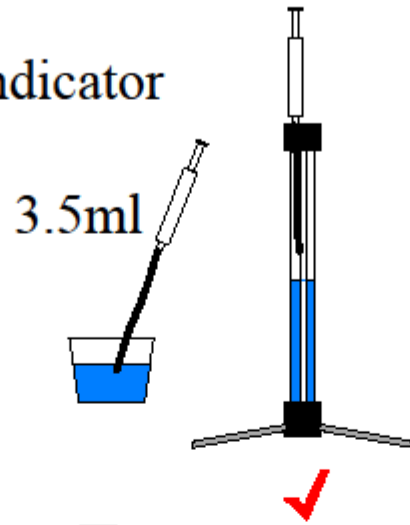
*Over-sucking may cause the water to shoot down the flexible tube. If this happens, detach the tube and blow hard down it to clear. Check that the metal connection tubes are also clear and that the water levels return to zero. If they do not, there is a drop of water trapped at the top end.*

**Be 'virus aware'. Sterilize tubing if sharing with others.**

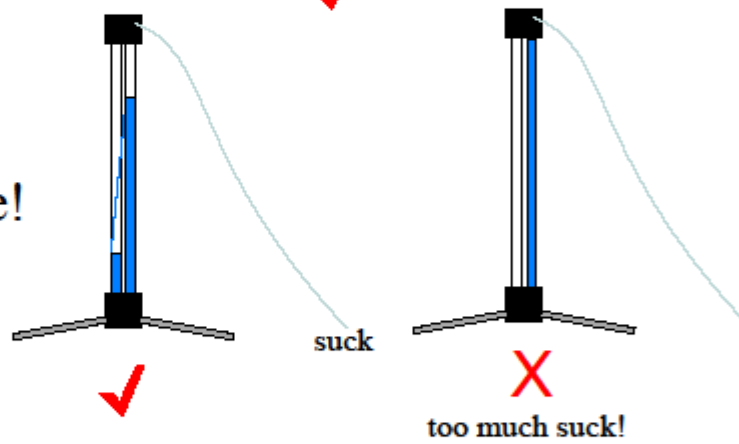
We hope you enjoy using your Flute Ferret, that it will save you time and help to keep your flute in top form.

*Email: [swessel@fastmail.com](mailto:swessel@fastmail.com)*

### 1. Filling indicator



### 2. Practise!



### 3. In use

