Northumbrian Smallpipes for quantity manufacture Time-line

- Initial concept Mike & Alistair 1997
- Initial Requirement Specification 1998
- Final Requirement Specification 1999
- Project started 1999
- First prototype part drawings 2000
- First prototype made 2001
- Production parts manufactured 2005

Designed for non-Specialist Manufacture

- All parts made by subcontract Engineering companies.
- All parts made from professional engineering drawings.
- Materials compatible with production manufacture.
- Materials to be safe.
- All parts interchangeable between sets.
- Vulnerable parts cheap to replace.
- Sets to be very robust.
- Concert G set with 3 drones.
- Target Price Less than £500 for a complete set.
- Designed for mainstream music teaching.

Prototype Set features

- 3 drones.
- Identical end valves.
- Irish style chanter stock.
- Significant commonality of parts.
- O-ring seals.

Lessons from the part procurement

Problems with the manufacture

- Sliding part bore machined tapered.
- Drone valve tolerances incorrect.
- Chanter stock O-ring grooves too shallow.
- Drone bores incorrect diameter.
- Incorrect part quantities delivered.

Final costs

- All the machined parts = £77.22/set
- Bags = £18 each (plus £180 excess postage).
- Bag Covers = £10.
- Bellows = £100.
- Reeding and assembly = unknown (no data recorded).

What have we done since restarting the project in 2010

- 2010: 6 sets assembled from parts and used to develop more reliable reeds and to work out how to solve some of the sub-standard machining.
- 2011: Sets used for successful Folk Festival event
- 2012: 10 ex-Sage non-working sets refurbished
- 2013: The 10 sets now used for teaching at Bellingham
- 2013: The remaining stock of un-assembled parts recovered from the Sage and sent to Mike Nelson to be assembled into working sets.

2013: 30 sets being assembled for September delivery

What is the best we can achieve?

Quite a lot of parts have gone missing during the storage at the Sage and we have now done a full audit of the parts been delivered to the NPS from the Sage.

The maximum number of full working sets is limited by the available bellows and we have only identified a total of 48 out of an order of 62. It is very likely that there are more to be discovered.

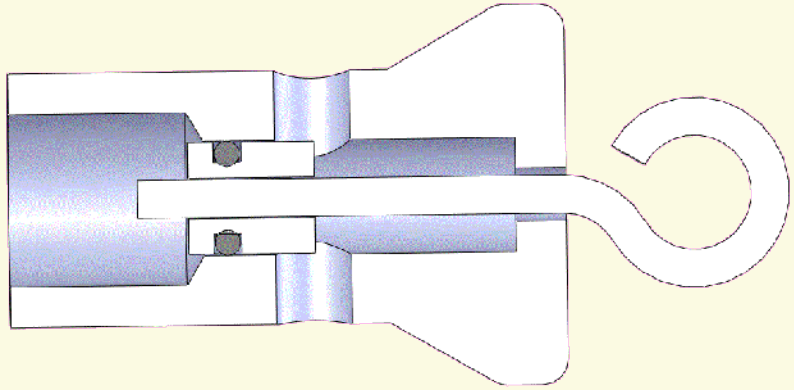
We have 152 bags, 53 bag covers and 83 unkeyed chanters.

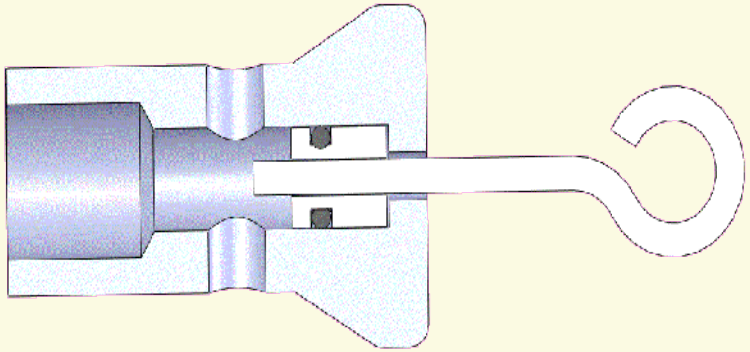
Next Steps for the project

- Funding??
- Design a concentric drone valve.
- Work out the dimensions for a small g drone
- Model and draw a 4 drone stock
- Design a 7 keyed chanter
- Prototype laser cut key parts
- Prototype bellows design
- Set up project to realise the 4 drone 7 keyed set

Design details of the 4 drone 7 keyed set

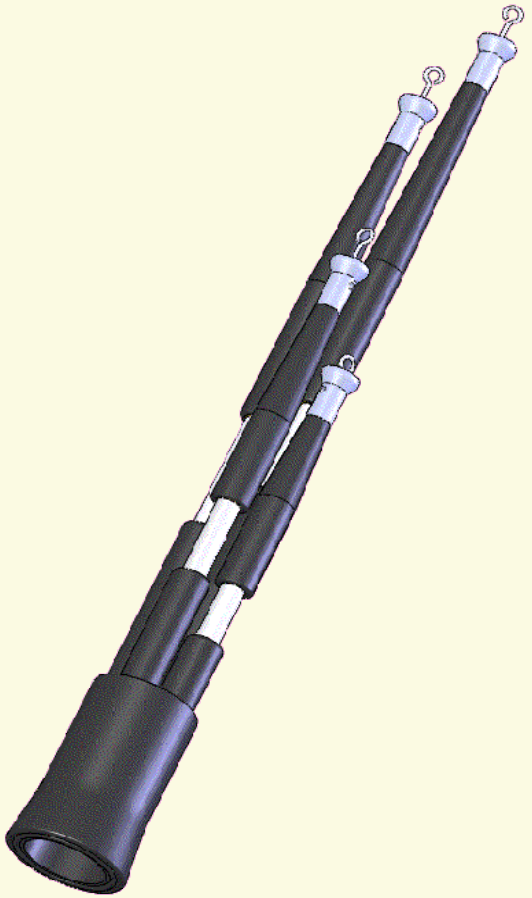
- Direct replacement for existing cross valve will enable existing drone parts to be used.
- Through cross hole will give a good drone sound
- Prototype currently well advanced



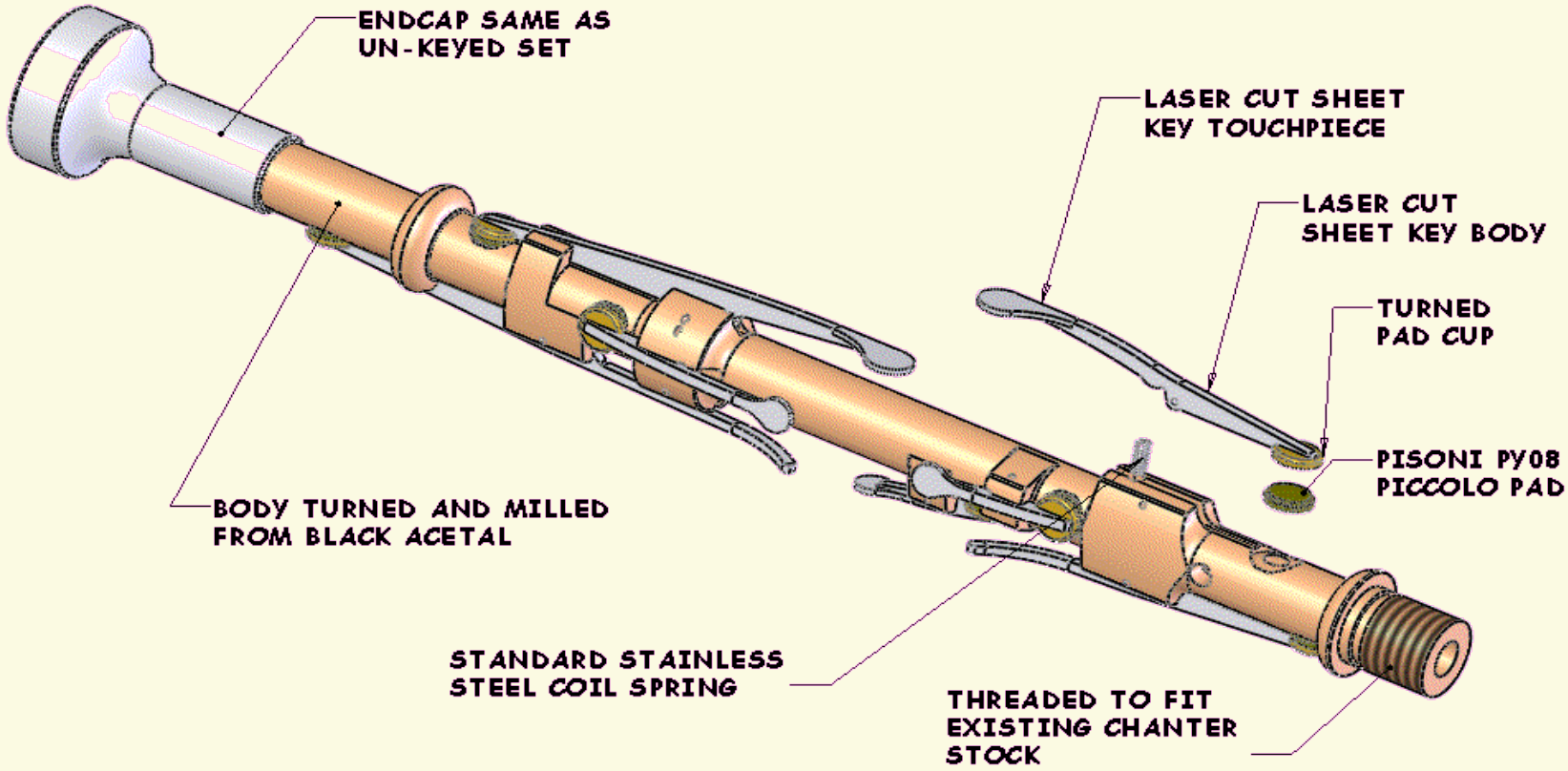


4 Drone assembly

Basic redesign done but the final dimensions need to be decided by making a prototype



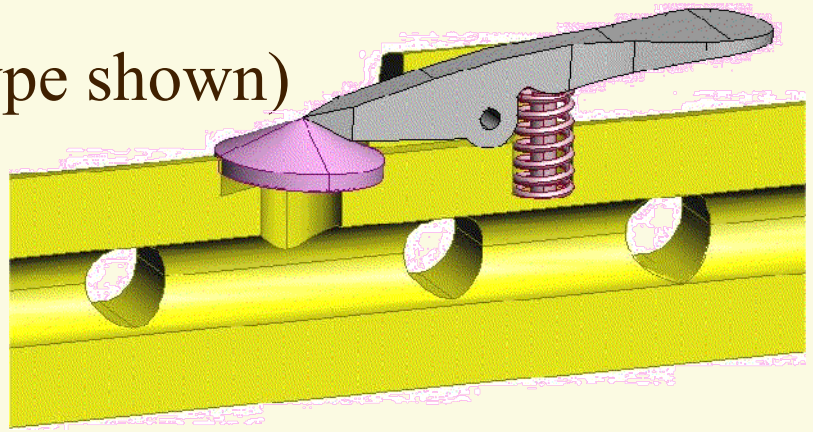
7 Keyed Chanter



Key Design

Coil Springs (2001 prototype shown)

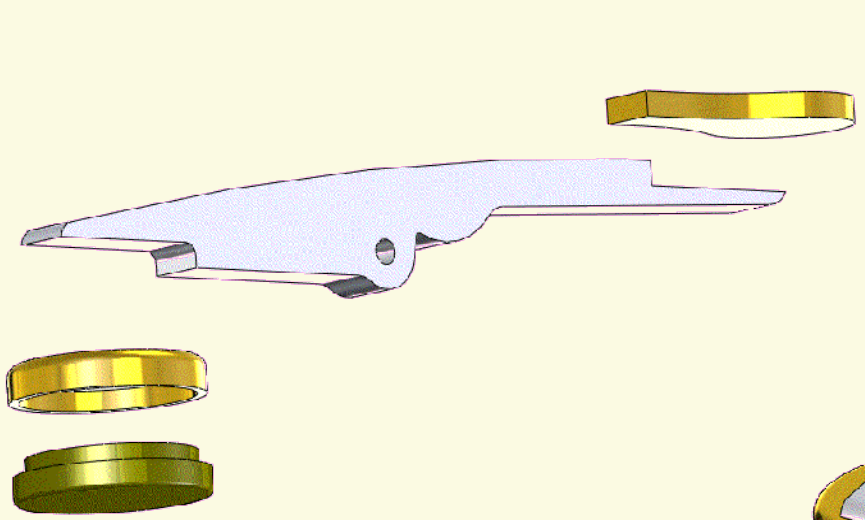
- Cheap
- Reliable
- Easy to fit

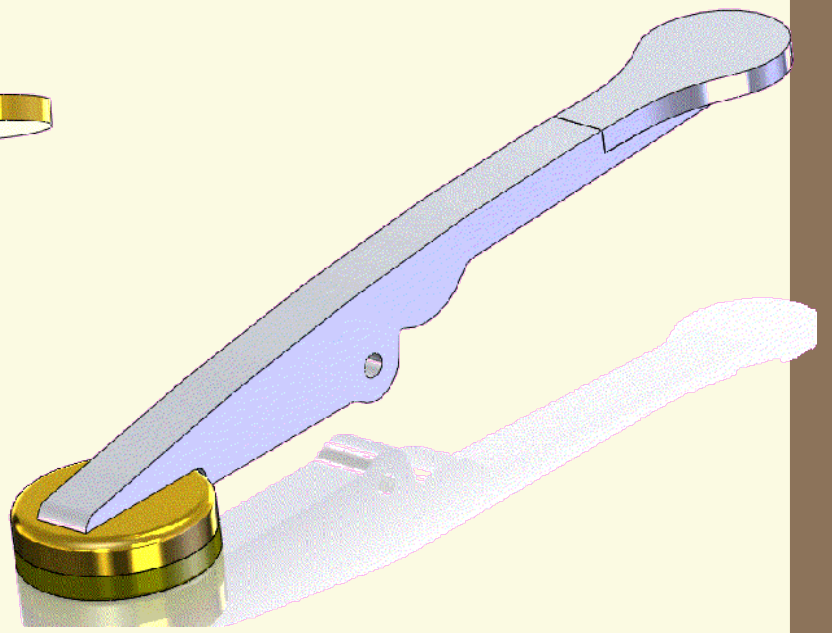


Key	closing force on pad	start force on touch piece (g)	finish force on touch piece (g)	spring used
b	60.8	69.7	95.6	CIM040BC 03S
a	96.28	60.8	95.2	CIM040BC 03S
d#	128.39	82.5	112.6	LCM035A 02 S
c#	128.39	82.5	112.6	LCM035A 02 S
F#	142.2	79.0	100.7	CIM040BC 03S
E	63.43	62.3	99.5	CIM040BC 03S
D	87.45	65.2	86.8	CIM040BC 03S

Laser Cut Key Design

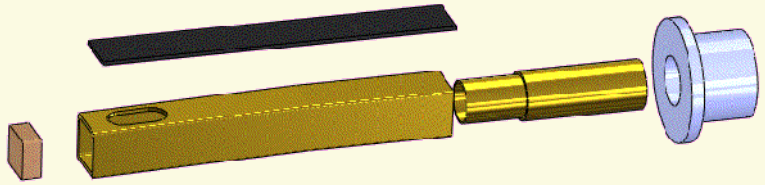
- Key Parts Laser cut from sheet
- Standard piccolo pad used
- Parts assembled on a simple jig and silver soldered





Drone reed development

Development of reliable & interchangeable drone reeds is very important



G drone reed

Features

Carbon fibre or plastic tongue

Brass square tube body

Top-hat mtg bush

Cyno'd balsa end seal

Soldered brass tube

O-ring bridles