Bagpipe Reed Selection, Manipulation, and Tuning

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Introduction

- Reeds are the bane of many a piper. Finding good ones, making them work, and keeping them working have befuddled every piper from time to time.

- I hope to show you some reed strategies and tactics that have been successful for me. Improving the sound of your bagpipe can make an enormous difference in your enjoyment of piping and others perceptions of you as a player.

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Drone Reeds

- Four Major Types:
  - Cane - traditional -- Antiquity
  - Plastic Body / Cane Tongue (i.e. Ross) -- 1985
  - All-Plastic (i.e. Shepherd) -- 1995
  - "Wood" Body / Plastic Tongue (i.e. Wygent) -- 1996
- Built-In Harmony - they're not there to annoy you!
- Three Drones - tolerate nothing less.
- Patience and Practice!!!

Cane Drone Reeds (“Cane”)

- **Sound**: Warm, mellow, harmonically rich.
- **Utility**: Infinitely configurable - bridles, hairs, bending, flexing, seating, sizing.
- **Reliability**: Decreases dramatically with temperature and humidity fluctuations.
- **Target**: Advanced players looking for that "fine" sound.
- **Cost**: Expensive - many are called, few are chosen. Life-span is often limited (osteoporosis).
- **Availability**: Many reedmakers worldwide. Notables include McNulty, McPhee, Watson, Lumsden, Sharp, etc.

Plastic Body / Cane Tongue Drone Reeds (“Ross”)

- **Sound**: Rich, very cane-like (Victoria Police).
- **Utility**: Very configurable. Hemp bridles, elastics, hairs, bending, plug length (Ross). Very cane-like.
- **Reliability**: Ross tend to warble / stop as moisture beads on tongue. Cairns less affected due to marinated tongue. Designed to play dry (sheepskin, Ross bag, water trap).
- **Target**: Band or solo. Require some fussing, NOT plug-n-play. Can deliver professional-level sound.
- **Cost**: Reasonable - low compared to Wygent-type. Long life (years). But not 100% good-reed ratio.
- **Availability**: Geoff Ross, Cairns/Indian, (Champion?)

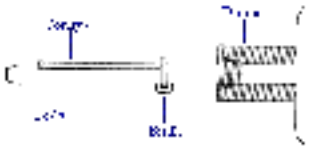
All-Plastic Drone Reeds (“Shepherd”)

- **Sound**: Hollow, somewhat “artificial”. Very loud.
- **Utility**: Few configuration options - bridles tend to be hard to work with and extremely sensitive to the slightest movement. Shotts retrofitted tight electrical tape instead of bridles (note improved 1998 drones).
- **Reliability**: Little affected by climatic changes.
- **Target**: Band players. May not be your best choice for solo.
- **Cost**: Inexpensive - though do they all work?
- **Availability**: Made by R.T. Shepherd & Son, many vendors worldwide.

Wood Fiber Body / Plastic Tongue Drone Reeds (“Wygent”)

- **Sound**: Very Good. Can be somewhat loud by default.
- **Utility**: Very good - bridles for strength and pitch (but sensitive). Tuning screw (pitch) a real plus. Wide variety of insertion length into drone (pitch).
- **Reliability**: Little affected by climatic changes due to materials used. Plug-n-Play with some break-in req.
- **Target**: Universal - band / solo, all grades.
- **Cost**: Expensive - BUT you get three good reeds for your $$$.
- **Availability**: Wygent (the original), Henderson Harmonic (plastic), Ezee-Drone further refinements, MacMurchie.

Drone Reed Illustrations

- "Cane" 
- "Ross" 
- "Wygent" 

Selecting Drone Reeds

- The key is to balance three factors to come up with a rich, harmonious, and steady drone sound:
  - **Pitch**
  - **Strength**
  - **Timbre**
- Cane: Pick reeds with a nice unblemished color, straight, clean.
- Replace or adjust wrapping if necessary to snugly fit your drones.
- Reed should vibrate and sound freely when blown in mouth. Pick those of a uniform pitch and strength.
- Cane: For high-pitched chanters and / or old drones - you may need thinner reeds. Mention this when mail-ordering.
- Cane / Ross: Replace factory bridles with firm black-waxed bridle at the split. Add a dental elastic for flexibility and mellowing.

Blowing in Drone Reeds

- Use a tuner set to the appropriate pitch to get an idea of their general tuning area, outside of the pipe.
- Cane / Ross: Replace factory bridle with black-waxed hemp bridle for stability, then add a dental elastic for fine-tuning and mellowing.
- Wygent: Patience - they may take more air at first. Reportedly require some hours of blowing in before mellowing.
- Replace one reed at a time if possible.
- Play at first with chanter corked to test uniformity, strength, and tuning area. Then add chanter. Adjust as needed to keep from stopping.
- General tip: keep your LOUDER tenor on the outside (if of differing volumes).

Drone Troubleshooting: General

- Keep them dry. A watertrap is a MUST.
- Clean the reeds out occasionally - get rid of stray fibers and other accumulated rubbish. Trim "flash" from tongues (cane).
- Keep your drone bores clean and unobstructed.
- Keep them in the pipes between sessions. Ensure that they're firmly seated and well-hemped.
- Cane (and Ross): keep bridles firm but not over-tight.
- Experience and patience are paramount.
- Hone your diagnostic skills -- be a "veterinarian".
- TEST your reeds before playing each day. Adjust strength and pitch as needed.

Drone Troubleshooting: Reed Stops (Cutting Out)

- Cause: Bridle too far down on tongue, chanter too stiff. A reed that is on the verge of stopping will NOT stay steady.
- General Solution: Move the bridle up.
- Cane / Ross: Re-tie hemp bridle, perhaps further up; move elastic bridle up.
- Cane / Ross: Insert hair under tongue. Adjust bridle / elastic.
- Cane / Ross: Bend tongue to more open position -- "training" the tongue".
- Ross: Tie additional bridle where tongue is affixed to "pop" tongue up. Check that tongue is aligned w/ body.
- Cane: Paper dip inside reed, under tongue - lift. (bass)
- Bass: check reed alignment - not touching side of stock.

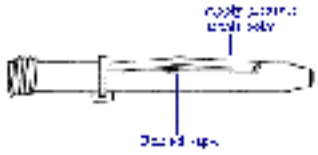
Drone Troubleshooting: Difficult Strike-In (Squealing)

- Cause: Bridle is too tight, tongue is curved upward too sharply. Reed is choked. Can also lead to unsteady whiney tone.
- Cane / Ross: Re-tie hemp bridle, loosening and/or adjusting position (up).
- Move bridle up a bit, take pressure off tongue.
- Cane / Ross: straighten tongue curvature via insertion of thin knife blade, matchstick, et al under mid-point of tongue and soften or flatten the bend.
- Ross: Tongue is twisted versus flat barrel. Straighten as above.
- Bass: Reverse-tongue bass often cures all. Some bass drones are very susceptible to this.

Drone Reed Tongue Manipulation

- Bending the tongue open

- Closing the tongue down



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Drone Troubleshooting: Excessive Air Consumption

- Cause: Tongue too open.
- Close down the tongue via moving bridle down. (Cane / Ross - elastic bridle)
- Remove hair if present.
- Cane / Ross: straighten tongue curvature via insertion of thin knife blade, matchstick, et al under mid-point of tongue and reverse bend.
- Make sure air is not leaking anywhere (i.e., from the plug end or from uneven blades).

Drone Troubleshooting: Tuning Too Low (flat)

- Cause: Reed or drone is too flat / too open.
- Check your chanter pitch - it may be too sharp.
- Move the bridle down. May cause reed to stop.
- Push the reed further into the reed seat.
- Wygent: Push the tuning screw further into the reed (but you lose some mellowness).
- Ross: Use the long plugs.
- Ideal position: just above the hemp line to about 1/2-way up the hemp. Bass bottom is generally lower (Grainger very low by default).
- Some drones tune chronically low - you may need smaller reeds.

Drone Troubleshooting: Tuning Too High (Sharp)

- Cause: Reed or drone is too sharp.
- Check your chanter pitch - it may be too flat.
- Move the bridle up. May cause reed to be too loud or take too much air.
- Pull the reed further out from the the reed seat.
- Wygent: Turn tuning screw further out from the reed.
- Ross: Use the short plugs.
- Ideal position: just above the hemp line to about 1/2-way up the hemp for tenors.
- Some drones tune very high on pins by default. Some have very long tuning pins (MacLeod).

Drone Reeds - Miscellaneous Maintenance

- Drying
  - Pipe cleaner or small brush
  - Blow moisture out of reed, then dry with brush. Allow to Air-dry after intense soaking.
- Cleaning
  - Pipe cleaner or small brush, sharp knife for cane tongues.
  - Cane: Blow out burs, splinters, etc. via holding tongue partially closed and blowing hard through open end, then brushing. Trim edges of the blades to remove "sticky" pieces.
- Airtightness
  - Cane: check wax seal on end - cane there is porous.
  - Wygent type: Teflon tape on tuning screw to seal leaks.
  - Ross type: ensure that plug is firmly inserted.

Chanter Reeds

- Three Major Types:
  - Streamlined Body
    - Usually more malleable - extra wood and robust construction.
    - Shepherd, MacAllister
  - Beveled Body
    - Thin blade tops can reduce malleability. Sometimes more plug-n- play than the shaped/molded reeds.
    - Warnock, Megarity-Ross
  - Plastic (ClanRye) - *not ready for prime time*
- A little guts makes for a longer life and better sound.
- Patience and Practice!!!

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Selecting Chanter Reeds

- The key is to balance three factors to come up with a rich bright chanter sound:
  - **Pitch**
  - **Strength**
  - **Timbre**
- Pick reeds that look well-made, robust.
- Replace or adjust hemp wrapping to snugly fit in your chanter.
- Should vibrate and sound freely ("**crow**") when blown in mouth. (May need a bit of moisture to prime it).
- Test them in your chanter or a similar model if you can. The acid test is with the drones - note imperfections show up better.
- Leave room for working and weakening them - they're easy to weaken, but hard to strengthen. ("leave some wood on them")

Blowing in Chanter Reeds

- Remove the tape on your chanter - start with a clean slate.
- Pinch the blades to bring the reed to a manageable strength.
- Moisten the reed slightly to "prime" it. INITIAL session only.
- Don't oversink to get instant high pitch - flatness is tolerable here.
- Cork or stop your drones - direct all air to the chanter.
- Play a few sets, whatever you can manage.
- The reed may sound good at first, then open up and flatten. Pinch it again, sand it (SLIGHTLY) if necessary.
- Play a few more sets, repeat the above process. Bring in the drones if / when you can (without shutting off).
- Repeat over several days, maybe a week. Raise pitch as needed.
- Fine tune individual notes as needed with well-tuned drones.
- Patience - a gradually broken-in reed delivers longevity / stability.

Chanter Troubleshooting - General

- Keep them dry. A watertrap is a MUST.
- Store the chanter / reed in a "dry stock" or "chanter cap". This protects it, keeps it drier, and avoids constant re-setting.
- Keep your chanter bore and fingerholes clean and unobstructed.
- Keep the reed firmly seated and well-hemped.
- Experience and patience are paramount.
- Hone your diagnostic skills -- be a "veterinarian".
- TEST your reed before playing each day. Adjust strength and pitch as needed.
- Find a good reedmaker and get to know his products.

Chanter Troubleshooting - Too Hard to Blow

- Cause: Blades too open; blades too thick; reed is leaking.
- Pinch / squeeze the reed: at the soundbox for heavy weakening; at the upper blades for less dramatic weakening. Careful - pitch will rise. Eventual goal is to "train" the blades to adopt a more closed position. Advantage: undo capability.
- Sanding: use very fine sandpaper - take wood off the upper blades. SPARINGLY!
- Scraping: use a sharp knife and "stroke" the wood off - from soundbox to upper blades with "molded" reeds.
- NOTE: Beveled reeds do not allow much sanding / scraping - pinching is your best option.
- Some pipers use a dental elastic bridle (like on a drone reed).
- Careful - you can't put the wood back on.

Chanter Troubleshooting - Too Easy to Blow

- Cause: Blades too closed; blades too thin.
- Open the reed (spreading the blades): at the sides of the blades, squeeze them open (wider ellipse). Very hard to do with a beveled reed.
- Open the staple, using a mandrel.
- Drastic: chop a tiny sliver off the top edge of the reed. This will also sharpen the reed considerably.
- A too-easy reed can be very difficult to control and blow steady robust tone.

Chanter Troubleshooting - Overall Too Sharp or Too Flat

- **SHARP**: reed too far in the seat, reed too closed / too easy.
  - Raise the reed in the seat.
  - Dampen the reed slightly (temporary fix).
  - Open the blades up (if it's too easy to blow).
- **FLAT**: reed too high in the seat, reed too open.
  - Sink the reed in the seat.
  - Dry the reed out if it's damp.
  - Pinch the blades together (if it's too hard to blow).
  - Reed may be too long overall - tip can be chopped (drastic).
- If you have to remove and/or re-wrap some of the hemp, ensure that the staple is covered - bare metal on wood is not good!

Chanter Troubleshooting - “Collapsing F”

- Cause: Reed sunk too far in, damp, too open. Often occurs at less than 100% pressure, but disappears when blown out fully.
- Unfortunate side-effect of modern chanter design - reeds must be sunk deeply to achieve the current high bright pitch.
- Dilemma: Often can’t correct above problems without affecting rest of the scale.
- Solutions:
  - Tie a hemp bridle around the sound box. Not too tight, not too loose - just enough to apply a consistent gentle pressure. Do not use an elastic - too much pressure.
  - The usual - pinch the sound box a bit, dry the reed, raise it in the seat.
  - Watch your blowing.
  - Drastic - chop the tip of the reed off - other side effects, of course.

Chanter Troubleshooting - Scratchy High A

- Cause: Reed is underblown, wood too thick at tips of reed.
- This is NOT the proper note, though some pipers do prefer it.
- Solution:
  - Sand (very lightly) the tips of the blades - this thins the "High A area" so it vibrates more freely. Don't overdo it.
  - Weaken the reed overall by pinching.
  - Make sure you're blowing the reed out full pressure.

Chanter Troubleshooting - Individual Notes Out of Tune

- **Cause**: Air column too short (sharp) or too long (flat) for that note in that chanter with that reed. May or may not be chronic.
- **Sharp Solution**: Lengthen the air column via the use of tape.
  - Start in small increments, check the note against the drones.
  - Keep your tape fresh, and keep spare tape close at hand.
  - Excessive taping *could* be a sign of a flawed setup - try adjusting the reed (particularly the wrapping / seating) instead.
  - Check the bore for obstruction.
- **Flat Solution**: Shorten the air column.
  - Try sinking the reed - often fixes individual notes without unduly affecting the others.
  - Carving individual chanter holes. "***DANGER WILL ROBINSON***". Don't try this willy-nilly, seek the advice of an expert. Can be very effective, but can also ruin a decent chanter.

Tuning - General

- Tuning is the art (science?) of bringing all of your reeds into harmony -- 474 / 237 / 118.5 Hz for example, and each note on the chanter at pleasing intervals.
- Tuning is a **learned** skill. Some are better at it than others, but practice and patience can enable most to produce a reasonably pleasing sound.
- Listen to the **sound waves**. When not in tune, they will clash with one another, producing a "beating" effect - the faster the beat, the further out of tune. The beating slows as tuning gets closer, stopping ("locking in") when the waves are synchronized.
- Don't allow yourself to play on untuned pipes - it's bad for your piping development, it's bad for "our" public image.
- Learn good tone and tuning by listening to the gods and demi-gods of piping. Watch, listen, and learn.

Chanter Tuning – Solo

- Everything revolves around Low A and the drones. (Chicken-and-egg situation here, but the chanter is easiest to tune when your drones are in perfect tune with Low A).
- Learn the intervals between the notes, the proper sound of each note. Fix this in your head, and use that as your reference.
- Get the overall pitch right first, then start adjusting individual notes vis-à-vis your Low A.
- Listen to the clashing sound waves against the drones - they will disappear (roll into a smooth harmony) when the note is in tune.
- Some notes are particularly hard - "F" for example.
- Use a "tuning phrase" to check notes in a fun and musical manner. Make one up, adopt one you like (they're royalty-free).

Drone Tuning – Solo

- Revolves around the Low A. Tenor drones are one octave below Low A, Bass drone is two octaves below.
- The sound waves from the three drones will clash ("throb" or "beat") against one another if they're not in sync.
- Start with just the outside tenor. Tune this to Low A. Hold High A (D works too, but less pleasing) with your left hand while you adjust the drone with the right. Check against Low A frequently.
- Do NOT tune to a one-handed E. This is a false note (E Flat).
- Bring in the bass drone. Tune it to the outside tenor. Listen for the deep throbbing to disappear -- for the sounds to converge.
- Bring in the middle tenor drone and blend it with the other two.
- Again, frequently check Low A - this is your "tonic" note.
- Eventually goal - minimizing stopping and starting of the drones.

Drone Tuning – Solo (cont.)

- P/M John Wilson: "Drones aren't much harder to tune than a radio, it just takes a little practice and patience."
- Timing: the drones will change in and of themselves, and versus the chanter as you play. Retuning is natural and expected. Eventually (15-20 minutes or so) they'll begin to settle. Tuning will be easier, in smaller increments, and they'll stay steadier.
- Without good maintenance, precise tuning is impossible.
- Watch your blowing - keep it uniform. Don't underblow when tuning - a very common problem. Drones out as soon as you play.
- Solo Competition: Don't start to play with obviously out-of-tune drones. Make an effort - judges appreciate that. Conversely, grossly extended tuning times can be annoying and unprofessional. **Key**: settle the instrument, but don't subject the judges and audience to a tune-a-thon.

Chanter Tuning - Band

- One chanter should be selected as the "master", by consensus of the PM/PS, etc. Should be on-pitch with an accurate scale. Play a few tunes as a band first - allow the reeds to warm up and settle. Tune drones via the meter to smooth the sound.
- Match the rest of the chanters one-by-one to this master via the "piper's scale" (E-B-A, etc.). Low A's can be verified via the meter. Once-around, getting the others "in the ballpark" - on-pitch. Badly out-of-tune notes corrected. Leave the drones ON while doing this (so the pressure does not change, which could alter chanter pitch).
- Play some more. Fine tune individual notes as needed. Reeds in dry stocks while taking a break - control the flattening.
- Don't panic -- they will flatten when you take a break. Blow them back on-pitch - plan your time accordingly.

Chanter Tuning - Band (cont.)

- Take severe cases aside to deal with separately while keeping the rest of the band playing and occupied - don't waste time.
- Do NOT overplay on the day of the contest - peak on the field. Play 10 minutes, stop for a bit, play again, etc. Monitor your situation and time your warm-up and tuning activities accordingly.
- Have a supply of "hot spares" -- blown-in reeds pre-set in spare chanters. Plug them in and go.

Drone Tuning - Band

- Meter highly recommended - Korg CA-20 or CA-10.
- Tune the drones of your master chanter. Calibrate the meter to the tenors. Verify against the chanter (Low A).
- Band plays, one person (someone with a good ear) circles around, tuning all drones to the just-calibrated frequency. Listen as well - don't just read the meter. Learn to work in tandem (ear/machine).
- Repeat, etc. as performance draws nigh. Recalibrate as needed.
- Individual pipers can be tuned while chanter-tuning takes place (no wasted time - "saturation tuning"). Outside tenor via the meter, bass and second tenor by ear, double-check with meter.
- NOTE: Korg CA series - set to "Manual" and use A-sharp (CA-10) or B-flat (CA-20). CA-10 must be recalibrated after power-off, CA-20 retains calibration on power-off.

Electronic Tuners

- Appeared late 1970s -- Professor Yamane (Japanese piper and Korg employee) -- usage pioneered by Ed Neigh, Guelph Pipe Band, in Canada in the late 70s / early 80s.
- Critics sneered at first, now almost universally accepted. The Strathclyde Police is one of the few Grade 1 holdouts.
- Original "Bagpipe Tuner" discontinued years ago, though still in demand among pipers. Most use a generic "Chromatic" tuner.
- Tuners are generally for band drone tuning, and of limited use for chanter tuning, except for determining your pitch versus "standard" Low A. Also great for chanter pitch "spot checks" in the band.
- Someone in the band (piper) should become skilled in its use.
- Should be viewed as an **aid** to tuning, not a panacea. It's strength is the ability to produce a uniform blended drone sound in a band environment. It is **not** a substitute for developing your own ear.

Electronic Tuners (cont.)

- Original: large format with analog needle (460-480 Hz). Chanter scale included - calibrated to Seamus MacNeill's "standard". Able to produce tones in chanter, tenor, and bass octaves.
- AT-2: probably the most numerous. Sold many in 1980s/1990s. Smaller, analog needle. Some formatted for pipes, others simple chromatic tuners. Some variants confusing to operate.
- DT-3: flat silver format. LED lights only. 1996. Can be calibrated to the Low A of a chanter. Utility hampered by low visibility in sunlight, and inability of meter to "hear" some bass drones.
- CA-10: palm-sized box. 1998. Calibrates to tonic note. Black LED digital "needle" format. Pitch adjustable versus A-440. Breakthrough price of under $25.
- CA-20: latest model - improved CA-10. Smaller, has memory for last calibrated pitch. Very inexpensive -- < $20.

Miscellaneous ...

- Very Hot Dry Day - Crushed Ice in the bag (non-Ross) can provide some critical moisture content to keep reeds from stopping. With a Ross bag, remove some kitty litter from the canisters instead.
- Warm your chanter reed between thumb and forefinger for a few seconds for a quick pitch rise.
- You'd be amazed at the difference a simple re-wrapping (and subsequent re-seating) of the chanter reed hemp can make - in pitch, timbre, and accuracy of scale. Try this before giving up!
- Check your reeds before you play - correct any problem areas BEFORE your warm-up / blow-in time (drones stopping, chanter too hard, etc.). In front of the judge or in the circle is no time for this.
- Learn your own instrument's blow-in time to reach optimum pitch, tone, and steadiness. Give yourself plenty of time: play / rest / play. Know when you're on and have the pipe at its peak.

Final Thoughts

- This is an expensive hobby. Expect to spend some money if you want top quality. If you want to save money, buy a kazoo.
- Hone your diagnostic skills -- be a "veterinarian". The reeds can't tell you what's ailing them - you need to diagnose and act.
- Without proper maintenance of the instrument (wrapping, seasoning, cleaning) you will ALWAYS struggle with your pipes.

The Last Word ...

- The Big Payoff -- You can't impress the audience and win consistently without a good pipe sound. This doesn't guarantee victory, but the lack of it will guarantee defeat.

Resources: a non-exhaustive list of Quality Reedmakers

- **Mark Wygent -- Synthe-Drone and Chanter Reeds**
  - 46 Sadler Drive, Christiana, PA 17509-9703
  - Phone -- (610) 593-5353. Web -- http://www.wygent.com/
- **Colin Cairns / Iain Indian -- Synthetic Drone Reeds**
  - Web -- http://www.ozemail.com.au/~riainind/
- **Megarity-Ross -- Cane Chanter and Drone Reeds**
  - Phone -- (949) 460-9325. Web -- http://www.megros.com/
- **R.T. Shepherd & Son -- Cane Chanter and Plastic Drone Reeds**
  - Web -- http://dspace.dial.pipex.com/shepherd-bagpipes/
- **Chris Apps -- Cane Chanter and Drone Reeds**
  - 78 South Street, Tillingham, Southminster, Essex CM0 7TH, ENGLAND
  - Web -- http://www.appsreeds.demon.co.uk/
- **Colin MacLellan -- Cane Chanter and Drone Reeds**
  - 7-585 O'Connor Street, Ottawa, ON K1S 3R2 CANADA
  - Phone -- (613) 234-1826. Web -- http://www.hom.net/~georgel/colin.html

Tone Vote

- Listen to the following combinations of drone reeds and chanters, and rank them in preference order. In each case the **drones** are MacDougall, and the **chanter reeds** are Shepherd.

- ____ Shepherd plastic chanter, Wygent Synthe-Drone Reeds

- ____ Gibson wooden chanter, Wygent Synthe-Drone reeds

- ____ Shepherd plastic chanter, Cairns / Indian drone reeds

- ____ Gibson wooden chanter, Cairns / Indian drone reeds