Notes/tips for loading of subsonic ammunition in centrefire rifles.

(Customer information sheet – draft as at 26/11/2017. D.F. Maisey. Last updated : 12/2/2018)

1. Before fitting any suppressor to the rifle, firstly test for bullet grouping, accuracy and stability, as well as the actual velocity measured with a good chronograph. This is extremely important, especially with subsonic ammo. You MUST confirm that the bullet is adequately stabilised in flight, and able to clear the suppressor correctly, before fitting the suppressor onto your rifle. (Bullet strike may destroy suppressor.)
2. Factory loaded subsonic ammo can vary a lot from the manufacturers stated velocities, due to barrel length and other bore dimensional variances - some actual velocities may be almost supersonic.
3. **NOTES about Lehigh Subsonic projectiles:**
   a) BEWARE if using Lehigh 168gr control-fracture brass bullets for subsonic deer hunting loads. They **MUST be run @ 980-1000 fps** at the muzzle, or as close to this as possible. Closer to (and beyond) 1200 fps they will blow apart in flight, shortly after exiting the muzzle, potentially destroying the suppressor. We tested a .300 BLK with a 1:7 twist barrel, and at about 1200fps the projectile (or parts of it) were not actually hitting the 12" square target at 50m, and even at 25m there was still no trace of any sort of hit on the target at all – nothing!! This is one reason why you must never fit the suppressor until you know for sure that your loads are good.

   (Picture to the right shows 168gr Lehigh projectile, the same loaded in a .308win case, a 178gr ELD-X projectile, and a 220gr Round-nose projectile for comparison purposes.)

   b) The **Lehigh 168gr projectiles will ONLY work in 1:8 twist or 1:7 twist .30cal barrels**. The standard .308win 1:12 or even 1:10 twist barrels just will not stabilise these long projectiles at all.

   c) The performance on deer with these subsonic projectiles has to be seen to be believed. They have been described by one of our customers as *"like small hand-grenades"* on deer. Another customer (and professional shooter) has described Lehighs and being the ONLY bullet suitable for subsonic hunting of deer, and further that **he considers the use of conventional copper/lead bullets on deer as *"pretty much unethical"***, as conventional centrefire bullets simply do not create the wound channel required, or any hydrostatic shock, at subsonic velocities.

4. Suppressors that have a longer 'muzzle-forward' section and more baffles, will usually tend to work a bit better/quieter with subsonics than some suppressors that have a very short muzzle-forward section.

5. With subsonic loads it is always best practice to start your powder charges slightly 'high', and then work down – basically the complete opposite of standard loading practice. You are trying to get the projectiles to run reliably and consistently around 980-1000 fps if possible. At higher elevations the air is thinner, and a load that shoots around 1000fps at 100m above sea level, may shoot 1050fps or

1060fps at 1200m above sea level. i.e. loads at 1050fps at sea level are likely to be supersonic (beyond 1080fps) at higher elevations. Running your projectiles too slowly can cause problems such as erratic velocities/accuracy, or even complete failure to exit/clear the bore ! ***(Subsonic loads in picture to the right (above) – 148gr cast lead with copper gas check. Also some 100gr semi-jacket varmint bullets to @ 1300fps. Great for cheap shooting and small game hunting.)***

6. Only attempt to fire subsonic loads in a rifle where the bore is in mint condition. Do not attempt to shoot subs through a barrel that is rough or badly pitted. The types of projectiles used should also be those specifically suited to subsonic use in centrefire barrels.
   Lead bullets (ideally fitted with a copper base ('gas check') and some form of lube applied) are ideal for low-cost plinking and small game hunting. Special-purpose lathe-turned brass or copper bullets specifically designed for subsonic hunting of larger game animals (such as the Lehigh 168gr controlled-fracture, CNC-machined brass projectiles) should be ok in most 1:7" or 1:8" twist .30cal barrels, provided that they are cleaned & maintained in good order, and with a nice smooth bore finish.

7. Be VERY careful if you are intending to use standard copper jacketed bullets that are intended to shoot larger game animals at velocities above 2200 fps, but loaded at subsonic velocities. (i.e. .30cal 220gr to 240gr Sierras or Hornadys, etc.) Especially with those projectiles which are very heavy or long-for-calibre, having a much longer bullet bearing surface engaging with the bore. THE FRICTIONAL DRAG OF THESE PROJECTILES may be ok at subsonic velocities for a few shots through a recently-cleaned bore, but with velocity that is too low combined with a bore that becomes increasingly 'dry' after a few shots, the co-efficient of friction between the bullet and the bore surface can increase to the point where the bullet may suddenly fail to exit the bore. (see pic attached.) If this scenario ever happens to you, and/or you suspect that something is wrong or didn't sound 'right' after firing a shot – **STOP** !! Withdraw the bolt and check the rifle. UNDER NO CIRCUMSTANCES should you attempt to fire another shot until you have confirmed or made 100% sure that the bore is clear of any obstruction. Be mindful that with a suppressor fitted and in the field a shooter may be almost totally unaware of what has occurred until it is too late, and thinking that they have simply missed the target and loaded up another round behind the stuck bullet. The results are likely to be ruined suppressor and split barrel. This is one reason that you need to be very careful with your load development and bullet selection with subsonics, and also be very meticulous in your cleaning regime for any rifle firing subsonic centrefire ammunition.

8. **Neck tension, and its' effect on velocity and accuracy.**
   This is something to be aware of, as the brass case work-hardens then the neck tension applied to the projectile will vary. If you then end up in a situation where you have a mixture of old and newer brass (with less times sized and fired) then even if your powder charges are the same, the variations in neck tension (and the resultant projectile release tension) you will start to get velocity spreads wider than you should be, and this will affect your accuracy potential. It may be prudent to have your brass cases

annealed every few firings for best results and longer case life, and (done properly) this will avoid the case necks getting too hard or brittle as well.

9. Best practice and diligence in your reloading techniques and good 'housekeeping' is recommended. Accurate subsonic loads require a good level of attention to detail and consistency. I cannot stress this enough. Velocity variations of 40fps in high-velocity loads of (for example) 2850fps may not be significant, whereas 40fps spread on loads doing around 1000fps can result is significant variation in bullet drop or grouping, depending of course on exactly what the range is.

10. Load development: suggest starting at no more than 0.5g increments which should give you a change in velocity around 30-40 fps, and once around subsonic go down to 0.3g increments.

11. With Trail-Boss powder you must carefully weigh each load. You can't rely on a scoop or powder dispenser throwing consistent loads.

12. Beware of 'undercharge' loads – as is well known by those in the cowboy action shooting circles, the risk of un-expected 'detonation' or 'blow-ups' due to undercharges of powder in a given cartridge, does come with some serious consequences if you get it wrong. Always use a powder which will fill the spare space in the case (once the projectile is seated) as much as possible, while providing the velocity levels which you require. 'Trail Boss' is a high-volume powder specifically designed for reduced power loads, and works well in many cartridges, including the .308win. ADI Sporting Powders (Technical staff) do not recommend going to a powder charge less than what would fill about 70% of the available case space. Sometimes the use of a 'filler' such as Dacron™ (or other products) may do the required job to hold the powder charge reliably back against the primer, in order to prevent the 'flashover' (multiple ignition) or 'detonation' effect (theory), but such fillers may cause issues when using a suppressor. So think and prepare carefully before loading.

13. For virgin .300 Blackout brass, it is a good idea to 'fire-form' the cases to suit your rifle's chamber firstly with full-power loads. This will allow the (relatively narrow) shoulder/headspace contact area to blow-out upon firing and 'form' correctly. This can help with reliable headspacing. The cases can then be full-length resized just enough to touch the shoulder and push it back 0.001" to 0.002". The low pressure generated by subsonic loads just simply does not have the pressure to fire-form brass cases properly, and you will also notice a difference in the surface of the primers of fired subsonic cases.

Both pictures above showing fired 'high-velocity' cases on the left, and fired 'subsonic' cases on the right. You can see the flatter primers and the more defined fire-formed shoulder from the HV loads.