This is a summary of my tests on Chinese 1842 and 2040 tubes. The original Topic with comments and contributions by others can be found at The Slingshot Forum (http://www.slingshotforum.com)

I've owned a Dankung Jungle Hunter II for more than a year. Right up front, I'll say I don't like the Dankung, but I do like the thin Chinese tubes. I plan to test a variety of configurations, and will use the Dankung because of the ease of changing tubes. To kick things off, here are the results I got from the original OEM bandset, which I assume were 1745.

Pull weight at 30 inches - 19 pounds
Velocity -
.375 lead ball (75 grains) - 192 fps avg 5 shots
.429 lead ball (115) grains - 182 fps avg 5 shots
.495 lead ball (175 grains) - 161 fps avg 5 shots
Note: all measurements were made with my computer and Audacity. Later I will compare the computer measurements against my Chrony.
* Velocity measured at my normal 32~34 inches draw.

Further testing will be with 1842 and 2040 because that is what I have.

I just spent an enjoyable hour shooting and recording Chrony readings.

The first step was to measure a Cholita with #107s to see how close the Chrony is to my previous computer measurements. I got a 5 shot average with .375 lead of 185.4 fps vs 178.7 with the computer, a difference that could easily be caused by warmer weather or a slighter longer draw. Close enough.

Then I compared my older Lee mold ammo against the newer (and slighter smaller Do-It mold ammo. The Lee balls measure .375 and weigh 75 grains, the Do-It balls are .364 and weigh 71 grains. Using 1842 tubes cut to OEM length with a Jim Harris pouch on the Dankung frame, the Lees averaged 212 fps and the Do-Its averaged 212.4 fps.

Next I shot a round with Do-It .31 cal. (actual diameter .304, weight 40 grains) for a 5 round average of 235 fps.

Having already measured the 3/8 inch balls, next up was .429 lead, calculated weight 115 grains. They zipped in at 202 fps.

Finally to round out the doubled 1842 tests I shot .495 balls, calculated weight 175 grains for a 5 round average of 184.4 fps.

Next up, some surprising results with "tapered" single 1842 tubes.

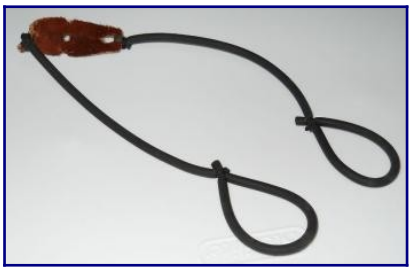
Just a teaser. I took a few shots this morning (OK, about 50), and with lightweight ammo, I am confident of hitting 300+ fps with Chinese 1842 tubes. I'm averaging 285 fps and one shot went 293 with .25 cal (6.35mm) steel. I'm hitting 260+ with .30 lead.

The double set is 7 inches, the "single" (more about its construction later) is 7.5. That is one of the variables I intend to explore. What is the optimum length for me? Once I determine that, we should be able to take a person's draw length and calculate the optimum for him/her.

Yes indeed, they are quiet, and handslap is almost non-existent, even with .25 steel.

This morning I will be trying .177 BBs, but have to make an ultralight pouch first. My theory, which may be wacko (we shall see), is that if we reduce the weight of the projectile and pouch as much as possible, we can then measure how fast the bands are capable of retracting, and then know the absolute maximum speed of those bands.

OK, here are my results with the looped singles. First a picture of the bands.



The loops measure 2.5 inches (6.35 cm) and the single portion is 5.0 inches (12.7 cm). The pull weight is 8.9 pounds at 32 inches. This is the first round. I have since achieved higher velocities by increasing my draw length. (See post above)

Velocities

.25 cal (6.35mm) steel - 282.8 fps - 2.88 lbs/ft energy.
.304 lead (7.7mm) - 255 fps - 6.0 lbs/ft energy *
.363 lead (9.2mm) - 211.4 - 7.04 lbs/ft energy *
.429 LEAD (10.9MM) - 177.54 - 8.18 lbs/ft **

* These two rounds were real eye openers. Not only is the velocity with .363 almost exactly the same as with the double set (212.4), the .304 is actually faster with the single bands, at roughly half the draw weight. (8.9 vs 15.8)
** The bands are obviously overloaded at this projectile weight, losing more than 20 fps to the double set. Even so, the higher energy level indicates that more speed can be achieved with the lighter projectiles. If my theory is correct, we should be able to get close to 300 fps with .304 lead and somewhat over that with .25 steel.

I'm going to bite the bullet and pay the price for 70 3/8 steel balls, since that is what almost everyone uses. Why don't you guys all switch to lead and save me 5 bucks?

I am now as close to the optimum configuration for maximum speed with light ammo as I consider needful and practical. I won't go into all the details of how I arrived at these dimensions, suffice to say I tied a lot of bandsets and made a lot of measurements. With each new set, I would make the looped portion longer and then trim the single portion a half inch at a time until the bands could not be stretched (by me) any further. Almost every set started at an overall length of 8 inches and maxed out at 5 1/2 to 6 inches. Each time I increased the looped portion length, once I had cut back to about 6 1/2 inches, I got velocity increases. There is, of course, a limit.

I have learned that double sets (like those supplied by Dankung may have lower velocity for light ammo than these, which I will call “tapered” for lack of a better term. I settled on a 4:3 ratio of doubled to single with a total length of 7 inches (17.8 cm). There is more velocity available than I achieved with this configuration, but at the expense of short band and pouch life.

If you want to duplicate these, cut the tubes to 11.5 inches (29.2 cm) Loop one end back so that there are 3 1/2 inches of single tube left (loop 8 inches). Clamp the looped end very near the end with a hemostat. I use a bench vise to hold the hemostat. Pre-stretch the loop and tie as close to the hemostat as possible. I use white waxed string and a constrictor knot. Whatever you use make sure the tie is very tight or you may experience slippage. I tie the pouch by feeding 1/2 inch (1.27 cm) through the pouch hole, clamping with the hemostat, lots of pre-stretch and a constrictor knot as close to the pouch as I can. I will post a tutorial on making these soon.

If you use a short draw, you can adjust the dimensions. Just maintain the 4:3 ratio. I'm drawing about 38 inches to get the velocities below. That is 5.4 stretch factor. I thought my draw was 34 inches, but it seems I've gained some arm strength in the last 6 months.

Today's measurements: All listed are 5 shot averages.

.25 cal (6.35mm) steel – 308.7 fps (94.1 ms) 3.44 lbs/ft (4.66 joules)
.304 (7.7mm) lead – 283.3 fps (86.3 ms) 7.43 lbs/ft (10.07 joules)
.375 (9.5mm) steel – 273.7 fps (83.4 ms) * 9.12 lbs/ft (12.36 joules)
.363 (9.2mm) lead – 242 fps (73.76 ms) * 9.25 lbs/ft (12.51 joules)
.429 (10.9mm) lead – 205.5 fps (62.6 ms) 10.98 lbs/ft (14.89 joules)

* Note: the .375 steel weighs 51 grains and the .363 lead weighs 71, which accounts for the smaller lead ball having a lower velocity than the steel.

As we have seen in previous posts, there is more speed to be had from 1842 rubber, but I'm hoping this configuration will be a happy compromise between raw speed and band life. I hope some of you folks will build your own tapered 1842 bands and report your results.

This is not the end of my experiments, but bandsets built to these dimensions will give you a significant increase in velocity over the standard Dankung double sets for ammo lighter than 3/8 lead. I will continue to post results as I get improvements.

I made a brief side trip into the raw power side of tapered 1842. I wanted to see if I could get 200+ fps with .495 lead balls. I got 222 fps (67.7 ms), 19.96 lbs/ft (26.69 joules). I have no doubt there is more power there, but I'm not strong enough to pull past 32 inches without shaking enough to endanger my Chrony. I'll have my son take a crack at it later. This is Mr. Stubby with the double tapered set.

Back to the double set, I knew the power was there, and my son just proved it. His fastest shot with the double bands and .495 (12.6mm) lead ball was 259.1 fps (79.97 ms) for 26.8 lbs/ft (36.36 joules). He also took a shot at a fallen green coconut. The ball penetrated all the way through the husk and shell and we could hear it rattle inside when we shook it.

His one shot with a 3/8 lead ball was 327.9 fps, but some seriously painful band slap stopped that line of exploration.

4:3 1842 pull weight = 10 pounds 1 ounce at 32 inches.

Here are some of the results of yesterday's testing. I shot single 2040 and 1842 tube sets in several sizes of ammo. I also shot pseudo tapered and doubled 1842 sets, but won't post those results until I have done the same with 2040. I shot a series at each weight over the Chrony first at 30 inch anchored pull and then at my maximum pull of about 39 inches. I did not test 1745 tubes because I don't like the way they feel, and I get all the speed I need with the softer tubes. Here are the first results.

.30 cal lead ball (39.7 grains)*
2040 single - at 30 inch pull, average velocity 208.80 fps, at full draw 254.95 fps
1842 single - at 30 inch pull, average velocity 202.88 fps, at full draw 247.93 fps
Interesting to note that at this ammo weight, 2040 is faster than 1842.

.363 cal lead (74 grains)*
2040 single - at 30 inch pull, average velocity 176.80 fps, at full draw 214.83 fps
1842 single - at 30 inch pull, average velocity 188.12 fps, at full draw 216.48 fps
At this weight, the heavier bands work better. I plan to shoot some 3/8 steel later today and am betting that performance is nearly identical at that weight (53 grains)

*Note - I weighed 5 balls and divided by five to get an average weight.

Today's results with 3/8 steel (53 grains)
2040 single - at 30 inch pull, average velocity 205.30 fps, at full draw 239.58 fps
1842 single - at 30 inch pull, average velocity 203.87 fps, at full draw 243.93 fps
These results are so close that I believe this projectile weight is very close to the crossing point where 1842 becomes more efficient than 2040.

Here are the first set of completed tests, on 2040 and 1842 single tube per side band sets. All tests were made using my Natural Ringshooter #5. The shots labeled 30 inches were using an anchor with my knuckle in the hollow just behind my ear lobe and a slight forward tilt to the forks. The full draw shots were simply pulling the bands as far as I could.

I started the tests with .30 caliber (7.6mm) lead balls weighing 39.7 grains, and used increasingly heavy ammo until the power started decreasing. With these two band sets, peak power of 10.43 lb/ft (14.1 joules) was reached with a 125 grain .429 (11mm) cal lead ball at 194 fps. Maximum recorded velocity was 256.7 fps with 2040 and .30 cal lead. The chart below shows averages.

I don't know about you guys, but I am astonished at how much power I got out of such skinny tubes.

Henry those results closely approximate what I recorded with a 31” draw. The 2040 was on my want list, but after reviewing your results I’ll save the money. Thanks.
Henry’s
.30 Pb-3.62 fpe
.375 steel-4.89
.36 Pb-5.81

.429 Pb-6.53
Mine
.31 Pb-3.72 fpe
.375 steel-4.97 fpe
.375 Pb-5.83 fpe
.429 Pb-6.43 fpe

I had the comparison in side by side columns but the forum skewed them badly.

Edited by pgandy, 27 February 2012 - 04:37 PM.

Here are the completed tests on 2040 and 1842 pseudo-taper band sets, same methods as in previous post.

Again, I started the tests with .30 caliber (7.6mm) lead balls weighing 39.7 grains, and used increasingly heavy ammo until the power started decreasing. Note that with the 1842 set at full draw, there was still a slight power increase with .495 ball, but since there was a decrease at 30 inch pull, I stopped at that weight.

Peak power of 12.46 lb/ft (16.9 joules) was reached with a 125 grain .429 (11mm) cal lead ball at 212 fps. Maximum recorded velocity was 302.7 fps with 2040 and .30 cal lead. The chart below shows averages.

Here are the results of tests on the standard Dankung configuration, i.e. one long tube, looped, with both ends tied at the pouch. This chart clearly shows that at the lighter projectile weights, 2040 is more powerful than 1842. Somewhere between 161 grains and 173 grains, 1842 takes the lead. These figures represent velocities ranging from a high of 267 fps to a low of 119 fps. As a matter of interest, I recorded 302.7 fps with the same .30 cal ball and a pseudo taper 2040 set, proving that more is not always better.
Maximum recorded power was 17.17 lb/ft.

Unfortunately, I was unable to find any ammo that weighs 250 grains, so the jump from 205 to 308 is a bit more than I would have liked. Once all my tests are complete, I will make them available. I still have two more band configurations to test.

OK, I know that some of you guys are bored with all the discussion of lb/ft, because velocity is where the glamour is. So here are the results so far, of velocity measurements, from which the energy figures were derived. Note that with 39.7 grain .30 cal lead, pseudo-tapered outperforms looped. The looped configuration doesn't show a clear advantage until projectile weight reaches 125 grains. (.429 lead) I'm guessing that the crossover point is about 100 grains, but don't have any 100 grain ammo.

	A	B	C	D	E	F	G
1	Average velocities in feet per second with various band set configurations.						
2							
3	Projectile						
4	30 in. draw	single 2040	single 1842	tapered 2040	tapered 1842	looped 2040	looped 1842
5	30 lead	208.80	202.88	229.02	227.48	227.93	198.18
6	375 steel	205.30	203.87	216.17	218.05	217.52	211.05
7	363 lead	181.53	188.12	197.28	199.27	204.82	195.45
8	429 lead	154.40	153.48	164.45	162.88	184.83	177.76
9	357 bullet	130.75	133.13	146.65	146.65	167.55	164.37
10	495 lead	126.30	129.58	135.55	139.93	163.48	166.98
11	205 gr sinker					155.12	159.23
12	308 gr sinker					123.53	131.88
13							
14	full draw						
15	30 lead	254.95	247.93	297.08	271.53	262.10	223.00
16	375 steel	239.58	243.93	270.28	274.43	255.55	251.38
17	363 lead	214.03	216.48	242.61	238.13	235.65	215.78
18	429 lead	186.83	190.63	208.83	197.38	215.23	205.68
19	357 bullet	160.28	164.40	183.50	178.58	193.93	192.25
20	495 lead	159.08	157.85	174.40	174.83	186.35	193.05
21	205 gr sinker					155.12	159.23
22	308 gr sinker					146.40	155.70
23							

I got over 600 shots out of my last set, and it broke at the pouch. I just cut back a bit and retied. Considering the way I've been abusing bands in these tests, 600+ shots is very good. The cuffs seem to help, but in my case, I think it was the sharp edges of the hemostat I use to clamp while tying. I solved that problem by putting lengths of 1842 on the jaws.

I plan to do a separate tutorial on how to optimize band sets for your draw length, but here are the first results using a single strand per side, with a short attachment loop of 2040 tube, cut to allow maximum stretch factor just past my anchored draw (30 inches). The tubes including loop are 6 1/4 inches ring to pouch tie.

	A	B	C	D
105	Optimized Bands – 6.25 inches ring to fork tie			
106				
107	.25 steel @ 30 in.	307.00		
108	16.1	313.00		
109		303.00		
110		302.10		
111		298.80		
112		308.10		
113	**Average**	**305.33**	**3.33**	
114	.30 lead @ 30 in.	245.20		
115	39.7	259.70		
116		244.20		
117		248.00		
118		247.70		
119		243.10		
120	**Average**	**247.98**	**5.41**	
121	.375 steel @ 30 in	228.50		
122	53	228.60		
123		227.40		
124		230.70		
125		233.80		
126		228.20		
127	**Average**	**229.53**	**6.19**	
128	.363 lead @ 30 in.	206.20		
129	74	205.00		
130		206.20		
131		206.00		
132		208.80		
133		203.00		
134	**Average**	**205.87**	**6.96**	
135				

My single strand set of 2040 finally broke at the pouch this morning after about 1000 shots. Considering more than half those shots were with the tubes stretched to 90% of absolute max, I think that's not too bad.

I'm going to conclude my general velocity tests with this one, The relationship between 1842 and 2040 is well established and I have reached the upper limit of my ability to shoot strong bands. This set pulls over 25 pounds at 32 inches. I also believe there are better alternatives for high power than multiple strands of thin tubes. On the downside, they are a bit tricky to make, and fussy to keep dressed after each shot. Even so, if you have only thin Chinese tube, a double set of pseudo tapered 1745/1842/2040 will absolutely get you into small game hunting power levels.

There are only one set of figures for each ammo weight, because I can only pull this set a couple of inches past my anchor point. Maybe later I'll ask my son to give these a shot.

My latest measurements: All listed are 6 shot averages.

.375 (9.5mm) steel – 285.35 fps - 9.57 lbs/ft
.363 (9.2mm) lead – 267.52 fps - 11.75 lbs/ft

.429 (10.9mm) lead – 239.70 fps - 15.93 lbs/ft
.357 lead bullet - 213.98 fps - 16.35 lbs/ft
.495 (10.9mm) lead – 215.12 fps - 17.76 lbs/ft

Unfortunately, I was unable to properly test this configuration with heavier ammo, because the lead sinkers I have were causing fork hits, but I am confident this set is capable of more than 20 lbs/ft.