

The Business of Shooting Distance



LIPPARD

Professional Firearms

"The 400-yard difference"

The Combat NCO™ has established a maximum effective range of 400 yards. But what does that mean and how was it established.

The distance is a culmination of several factors.

1. Tolerance of the barrel bushing.
2. Tolerance of the barrel link to the barrel.
3. Tolerance of the barrel linkage to the frame.
4. Quality of the barrel.
5. Sights. Their height, width and range indicators.
6. Vertical alignment.
7. And Marksmanship training.

The **Combat NCO** was made to a criterion to meet a government standard as **an *Offensive weapon*** based on its then pistol platform 1911 A1. And while the list for that criterion is lengthy the area of this dissertation we will confine to the list above.

- One of the first criteria was the weapon had to be able to engage a terrorist enemy at a greater range. It had to be more accurate than the issue 1911 A1. It had to have better sights and a new system of using them to engage an enemy target. The result was the **Combat NCO patent sights and shooting system.**
- To address the accuracy issue involves shortcomings in the frame and slide as they were. Made of 4340 and even 8620 the metal itself was inferior and could not be adequately improved. This left us to examine the barrels which were defined by mil-spec and could not be changed; the barrel bushing which had tolerance issues with barrel binding, and the small bicycle link attached to the barrel and frame. These areas could be improved to a degree but greater still if we could reduce the tolerance of these basic areas of looseness. A challenge that took Lippard back to foundation of the *Browning design.*

So let's begin with the tolerance issues first which leads us to accuracy, then to the sights which allow us to shoot further, a benefit of this new tightness.

Browning barrels, like most are today, has straight wall sides. When the pistol is fired there is a delay in Slide disengagement of the barrel. BUT, the barrel does begin to move in an arc to the rear and downward. The barrel at the chamber face disengages as much as 0.070" is some guns which translate to an equal arc at the muzzle of the barrel *inside* the bushing. If adequate tolerance is not present in the bushing for the barrel, it binds. (Mil-Spec barrel is 0.580 -0.002" The Bushing is 0.582 + 0.002" giving a 0.004-6" gap for the barrel to move in.)

How to fix that binding problem: We can only have a "momentary" travel inside the bushing with the barrel to avoid binding. To achieve this, a small **barrel collar** at the muzzle end of the barrel is created. When the pistol is fired and barrel movement begins, this **collar releases contact** and the small diameter behind the barrel collar provides clearance preventing binding of barrel and bushing. Make sense? Sure it does but what about the close tolerance?

Close tolerance means friction and the **NCO Bushing is just 0.0005" clearance** of the barrel!! The Lippard solution was to cut grooves inside the bushing where a lubricant (Nickel Anti-Seize) could be placed where it would eliminate friction AND scrub the barrel twice on each cycle of the pistol.

How we tighten the tolerance of the barrel linkage: Frank Pachmayr had a good idea with his Wide Link which did tighten the barrel up at the link to frame but was flawed in two important ways. It did not allow for the use of a common unaltered barrel which provides for vertical and horizontal alignment. The Pachmayr barrel also had to cut the feet cut off.; another problem. But they had to be used on the first 1987 "**NCO Grade Combat**" guns.

The **Lippard patented solution (2)** says the linkage must be absolute with the barrel extension, the feet must remain to allow for adjustment of vertical and horizontal alignment, and it must be tight with the frame to deny yaw from barrel twist during firing; control the battery of the barrel during and after recoil to produce repeatability; and preserve the weapon over time from the combination of explosively firing the pistol.

Comes now the *Military Link*. The Military Link (Named for the military that requested the improvement and the intended beneficiary of the accuracy it provided to their pistols in service.) has a number of attributes that solve a lot of problems of accuracy in the 1911 buy aids in the longevity and service life of the weapons as well. Let's look at these.

First the ***Military Link*** is as wide as the barrel link extension. When it moves it moves in unison with the barrel and prevents it from yawing and deflecting during the weapon firing and loading. A positive function. In order to be installed the frame needs to be enlarged to accept the new ***Military Link*** which now occupies the entire barrel extension space inside the frame. This new close width prevents the barrel now from excessive movement in the horizontal and yaw as the weapon fires. Further the **Mil-Spec allowable tolerance** of Link fit to the barrel itself (0.009") and the tolerance of the Link hole to the Slide Stop (0.0065") had to be tightened up!! **Your pistol could have 0.015" movement here and combined with the Bushing slop of .004" a massive 0.019" is possible. Add to this tolerance of the Frame and Slide of 0.008" even if it IS in MIL-SPEC and you have a grand total of 0.027-29" movement on a common 1911 pistol!! The Combat NCO however allows for only 0.002-3" combined of the Bushing, Barrel to Link, Link to Slide Stop and Slide to Frame fit. And gentlemen as they say, that's the name of that tune!!**

Which one WOULD be more accurate to you? How CAN you expect to shoot further than 12 yards with a 1911 A1 with such a sloppy fit? The reality is, IT CAN'T.

Let me put it to you this way: **Would you buy a car that was designed 100 years ago** with nothing changed under the hood? And if you DID own a car made 100 years ago **would you drive it every day or Upgrade it** for greater functionality? A ***Combat NCO*** offers you the look and feel of the old 1911 but inside it has been completely upgraded to today's standards. **And the good news is, YOU can Upgrade yours to this new standard too!!**

But having solved the accuracy problem of Bushing and Military Link we now address the sighting problem preventing the 1911 A1 from shooting further than your nose.

The *Combat NCO* uses a "Touch System" for target engagement which says, you touch a target within Close Quarters Engagement range. How far is that? About 20-25 yards. Simply put "Point the bloody gun and Shoot center mass." In order to do that, we need to SEE the Front Sight blade. That blade height and width was determined by Lippard from tactical combat experience; ***and with a target in mind of..... 20" in width.....***

The *Combat NCO* Front Sight blade is 20" wide at 400 yards. Remember that as we go on to range and distance.

In order to tighten up the margin of error the **Rear Sight aperture** has been reduced to a specific width which offers minimal light on either side of the Front Sight blade when

viewed from a shooting presentation. This improves accurate firing and reduces human error the further distance the pistol is shot.

This brings us now to the business of 400 yards maximum range: You know now from reading above the Front Sight blade is **20” wide at 400 yards**. The width of a man. And you know now that the height to the BASE of the Front Sight blade must BE 400 yards and WHY that is. It is a culmination of the width I require for a Touch System, a height that is necessary to engage a target at Close Quarter Range and the known maximum distance the pistol can be aimed with the Lippard system on a 20” target.

The secret has been disclosed and why a **Combat NCO** demands a model change designation “**1911 A2**” compared to the old A1 made today. **The Combat NCO 1911 A2 is a completely different gun** as are all those Upgraded to an A2 standard as well.

How to shoot distance with the Combat NCO or 1911 Upgrades

We begin now with marksmanship. In short we need to get back to the basics of how to shoot a pistol. Then we will address the ways to shoot the pistol close and the methods of shooting it far.

- **How to Shoot:** Unlike a rifle a pistol is particular is a difficult animal to shoot well. As we have learned it must be accurate and most are not. It must have proper sights for the purpose and most are not. It must have a proper trigger pull of 2.8 pounds; most are not. And it has to have a trigger that is safe with a Hammer Sear ledge of 0.022” or more. Most ARE not. So in order to shoot well all these issues need to be fixed in the first place or our degree of success will be hampered enormously. But for this tutorial we will assume you OWN a **Combat NCO** or your pistol has been **Upgraded** with an “Accuracy Package” or “Distance Package.”
- **The Combat NCO was designed as an Offensive Weapon** and while there are many methods of shooting our weapon we are concentrating on the NCO method of shooting ITS pistol. You can learn a great deal by understanding the art of shooting listed here with your gun.
 1. **First is Sight Picture:** The Front Sight must be aligned vertically with the top of the Rear Sight notch. The target in turn must be placed on top of the Front Sight blade.
 2. **A well known “6 o’clock hold”** on a target was the standard for 100 years for the .45 acp and the military 1911 because the pistols shot high at 25 yards and you held low on a target. In turn it shot dead on at 50 yards if you were fortunate to have a pistol tight enough to shoot that distance and the man shooting it an expert in taming the otherwise close range pistol design. The Combat NCO can shoot point of aim to 1.5” high at 12 ½ yards; depending on

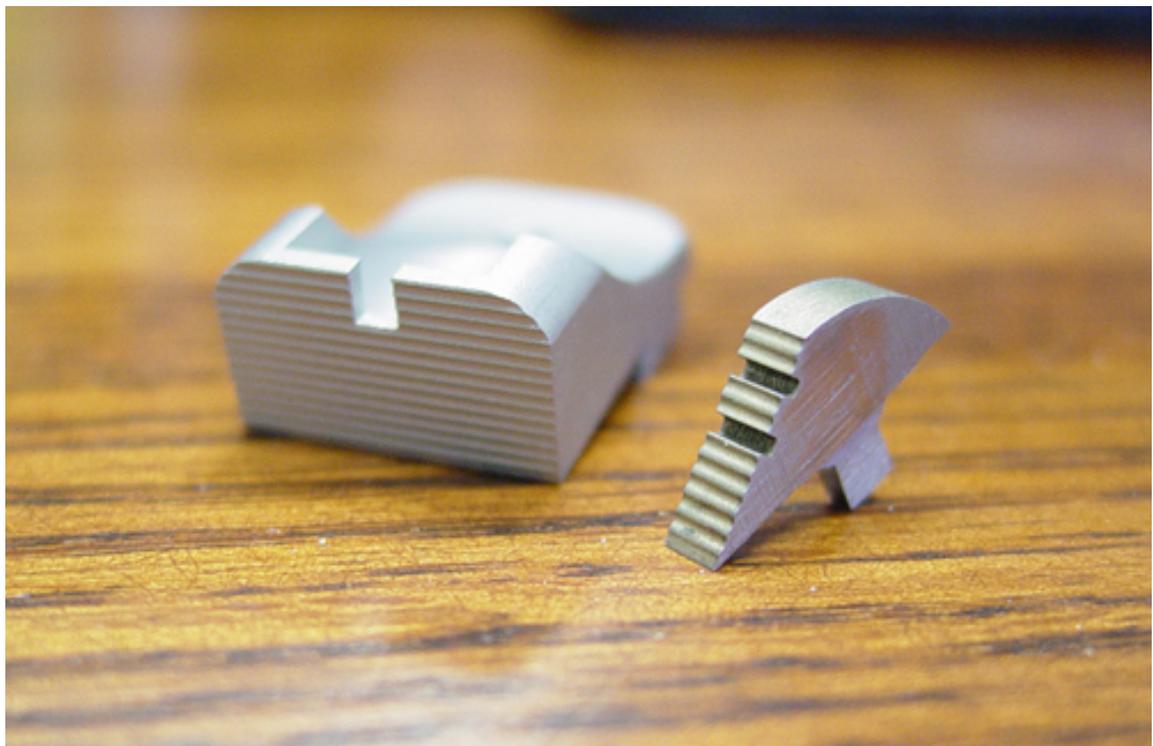
the ammunition. This allows for shooting into a 12" circle at 120 yards. **To shoot 120 yards do NOTHING but hold where you want to hit. No windage, no hold over, no nothing; just shoot.**

3. **A trigger pull weight to shoot anything well must be at least 3 ½ pounds:** Shooting distance you need to practice with that trigger pull of 3.8 pounds and use a two hand grip we will get into in a moment. It has been difficult to get below a 3 pound trigger in the past because the Hammer would follow the Slide in recoil back to a half cock position. In other words someone had been doing something with the Sear ledge, the Sear nose, and the Sear Spring, making it dangerous to shoot. In short, you DO have to KNOW what you are doing to GET a 1911 trigger below 3 pounds and be safe. Most do not; and therefore a 3.8 to 6.8 trigger is normal for military use.
4. **The placement of the finger is important:** The **fat pad** of the forefinger is where the finger is placed on the trigger. Not in the joint. This is the area where the finger pulls straightest in line to the rear. When the Front Sight of an NCO is on the target the finger is pulled tight. **“Touch it and shoot it.”** (Target shooting is different than combat shooting and not good to practice for the latter. Tactical shooting must ALWAYS be practiced exactly as it is to be used in a tactical situation. Do I need to repeat that? Target shooting is different than Tactical shooting. Practice how you intend to shoot.)
5. **Combat NCO shooting is done with two hands:** The right hand grasps the pistol and the first segment of the forefinger pad is centered on the trigger. The Left Hand grasps the left side of the pistol in the same manor as the right and the Left index finger wraps around the trigger guard in front of the Right Hand finger position. The pistol now should be pointing in its natural direction somewhat centered in the body line. This squares the pistol and allows for point shooting without adjustment of body to the gun. In a night situation you square to the sound and shoot. Glow in the dark sights have no use and after the first round you will be pointing to the target when last seen from the blast, firing at IT and then changing position before firing again. It is this two handed alignment and stabilization in firing that makes a Combat NCO successful in an Offensive mode of shooting.
6. **The NosePiece allows for stable shooting AND aids in night vision retention:** The *NosePiece* is a *compensator*. It properly balances the weapon, focuses gasses forward aiding in night vision retention and is sloped to allow sighted shooting over it at distance. Felt recoil is reduced considerably giving improved marksmanship, repeatability and shooter confidence. It has the same patent pending improvements as a NCO Barrel Bushing and can be exchanged in seconds to suit conditions or carry.
7. **Target Shooting and Tactical shooting don't mix:** We can shoot 50 yards without a rest if given time to do so as with Target shooting. Tactical shooting leaves one exposed to long. Any 20" target you cannot hit by “Touching” with 6 out of 7 rounds you automatically go to a rest position. So pull up and shoot in less than 1 second Six times. (NCO Tactical we shoot only Six) If you can do that at 20 yards, that's fine. If it is further as distance than you are qualified

to shoot “**Off Hand**”, go to a barrier, kneeling, prone or other support.

Automatically you move to another rest. Period.

8. **Distance shooting requires a rest:** The *Combat NCO* we know can shoot flat for 120 yards. (Depending on the ammunition) Some fine guns on the market can do this too for a little while until the looseness starts to degrade or shake the pistol apart...Given you have a good Trigger pull weight; use a wall, hand, knee or some other rest, you will be as ready to shoot distance to the limit of your capability. Except for fun serious shooting is always done from a rest to get the best results. One will learn to wear a hat he can use, what position he likes best and automatically go to that rest when shooting distances.
9. **How to use the NCO Sights:** The *Combat NCO* has two additional integral shooting sights built into the Front Sight blade. The first notch seen on the Front Sight represents a distance of 220 yards. The second notch represents a distance of 295 yards, while the base of the Front Sight blade represents 400 yards when the Rear Sight is lowered that level and fired. (Depending on the ammunition used) In order to do this well one must align his group at 100 yards in the Vertical. If you don't, you will be likely to miss the target at extended ranges and cannot effectively judge wind. You must use as small a target possible. I would use an orange line 4” wide and 1” tall to align the top of your front sight blade with. (See tricks for shooting far) “Call out” the Distance to yourself or aloud; and make your selection of sight or notch; squeeze the trigger, and fire.



Patent Pending Sights for 400 yard shooting

10. **Holding the pistol the same way and firing each time:** You use a good hand rest, put the point of impact on top of the Front Sight blade or drop the Rear Sight to a notch that represents a distance you want to shoot; hold the pistol with a normal grip and fire. Not loose and not real tight; a firm grip on the pistol, the same as with a rifle. The secret is repeating the same firing sequence time after time; exactly the same. Only THEN can you call your shots correctly and make immediate adjustments for the next shot.
11. **Adjustments to impact:** Remember 1" adjustment on the target for each 100 yards of range. If your impact is 24 inches left and knowing your front sight blade is 20" wide you can use it to calculate $24 \div 4 =$ a movement of 6". The front sight being 20" (about) you move over about 1/3 of the Front Sight width and fire again. (See ammunition) At 12 yards however 1" is about the width of a sharp pencil line adjustment on your Rear Sight Slide marker line. Mark a pencil line on your Rear Sight at the Marker Line. Loosen the set screw and move the Sight the direction you want the bullet to go. A Line Width for each inch you want to move is a good rule of thumb. The *Combat NCO adjustable Sight* when available will make this easier with precise movement indicators. It will in near future interchange with existing sights found on the Combat NCO and **be available for guns fitted with other popular sights without alteration of the Slide**. Keep watching for that. The difficulty of distance shooting is the different ammo you might be using and constant adjustment of your Rear Sight. A military Sight adjustment in contrast never changes. The NCO Adjustable Sight will allow for that positive adjustment.
12. **Adjustments to Wind; bullet deflection and wind drift:** Now comes the difficult part but it isn't when you have some experience. Shooting a rifle today with open sights most people don't do unless in the military. Your rifle doesn't even have sights today for the most part and a pistol; please, that can only BE a *Combat NCO sighting system*. But ok you've got wind but the good news is you have a pistol that can handle it by design. You need to learn to how to "call" or judge how much wind you have. With a pistol you need to learn how to calculate a number of factors which depends on ammunition, elevation above sea level, slope, bullet ballistic coefficient and how many teeth your brother lost when he was five; but I will give you some instruction...Let's pick on Karl. The last time Karl Lippard was shooting 400 yards as of today was on 6/6/2010 in Texhoma, Texas with his friend Wally Bridwell. He had a full flag cross wind estimated to be 15-20 mph. A guess. He held about (to the eye) 4- 4 1/2 feet into the wind. So let's check that and see how well he did. Go online and find **PointBlank™ shooting program** or another computer shooting program you can download. After loading in data for a .45 ACP cartridge, 230 gr. FMJ bullet, at 825 fps we can look over to the Wind information and see that a 10 mph wind, drifts a bullet 50.01"+ at 400 yards. Lippard said he was holding about 4 feet into the wind (Front Sight blade would be to his eye have been 2 widths from center mass. A 20 mph wind according to the Chart then would have been 100 inches of wind drift. Karl said he held 4-4 1/2 feet off the target so $48" \times 4 = 192"$ visually and hit

the target. What does it mean? It means wind that was standing the flag straight out was actually 20 mph plus. Likely he was shooting into a 30 mph wind or 150" of wind drift. Using substandard ammo results were mixed at that range down and velocity from the barrel for 825 fps Remington FMJ was varying down to 10% to just 800-810 fps. That would be about 177" of actual drift which by eye is pretty close to what was guessed. Add to that variance of accuracy angle which is about 4-6 minutes at 100 yards (4 x 4= 16" at 400 yards) it looks like I was pretty close. 16 + 177 = 192" cone of fire plus wind, minus actual fps. And as the witness said, "Any three men standing together that day at 400 yards, one would have fallen from each shot Lippard fired." (Wally Birdwell, Texhoma, TX witness) Or Karl was dead on to a little right. And a 4-6 minute pistol if you do the math will stay in a 20" man target all day with the right ammo. (The pistol tested and produced a 12" group at 200 from a Ransom Rest later by * C.J. Quinlan with junk ammo giving it a 6 minute accuracy at 100 yards.) It also means that an old man of age 65 shooting in over 100 + degree heat in a heavy wind can defeat a target at range with a **Combat NCO** with no practice but sighting in a borrowed gun #KL3000 at 125 yards with five rounds. (On video) Who then immediately followed with results at 200, 250, 300, 313, 350 and 400 yards. Yardage measured by two Laser instruments. Nothing up his sleeve there. And, the used borrowed pistol had more than 3000 rounds thru it at the time. An "Issued gun" so to speak...Therefore, you must square the pistol; (10) know your ammunition ballistics and call the wind (11) use your sights (8) hold your pistol (9) choose a good rest (7) and practice all these things enumerated. If you do, you WILL shoot effectively at distance.



* A used *Combat NCO Commercial Grade #KL3000* pictured above was tested by Marine C.J. Quinlan then calculates to a 1.625" group at 25 yards = 6.5 minutes of angle at 100yds. In contrast a Mil-Spec 1911 is 4.5 inch group at 25 yards or 18 minutes of angle at 100 yards and Mil-Spec then translates to a 72" cone of fire grouping possible at 400 yards. In other words a maximum range of a Mil-Spec pistol even scope sighted is 105 yards. Karl Lippard shot this pistol open sight 400 yards on 6/06/2010.

The Combat NCO™ has proven itself in combat and as an effect weapon platform. Because it has extended range means that men in combat can engage an enemy at a greater range than 25 yards. It means for the first time they can survive with a handgun and contribute to a battle where historically they could not before. It means that YOU, a private citizen, can improve your weapon and like a military Upgrade a 1911 to a new standard. **That new standard has been set and it rightfully should be called a model 1911 A2. Truly named as a complete package, it IS known by the men it serves; a "Combat NCO."**

Sgt. Karl Lippard, USMC, a Combat NCO

At midday on June 11, 2011 shooting at an open house demonstration at Ben Lomond Gun

Club, Ramah, Colorado; Sgt. Lippard shot a Combat NCO with serial number 300,026F; **4 of 6 rounds on a 18" steel plate at 600 yards in a 55 mph gusting quarter value tailwind** using Black Hills 230 grain, 950fps FMJ HP +P ammunition. Sgt. Lippard is 65 years old.

Trajectory for Hornady .451 dia. (45 Cal) 230 gr. XP-XTP at 950 Feet per Second
 At an Elevation Angle of: 0 degrees
 Ballistic Coefficients of: 0.188 0.188 0.188 0.188
 Velocity Boundaries (Feet per Second) of: 720 720 720 720
 Wind Direction is: 3.0 o'clock and a Wind Velocity of: 10.0 Miles per hour
 Wind Components are (Miles per Hour): DownRange: 0.0 Cross Range: 10.0 Vertical: 0.0
 The Firing Point speed of sound is: 1132.09 fps
 The bullet drops below the speed of sound on the trajectory (1132.09 fps) at: 00 yards
 Altitude: 5700 Feet Humidity: 50 Percent Pressure: 29.53 in/Hg
 Temperature: 70 F

Data Printed in English Units

Range (Yards)	Velocity (Ft/Sec)	Energy (Ft/Lbs)	Bullet Path (inches)	Bullet Path (1 MoA)	Wind Drift (inches)	Wind Drift (1 MoA)	Time of Flight (Seconds)
0	950.0	460.8	-0.5	0.0	0.0	0.0	0.0000
25	932.9	444.3	21.41	81.8	0.13	0.5	0.0797
50	916.7	429.1	40.84	78.0	0.51	1.0	0.1608
75	901.3	414.8	57.67	73.4	1.14	1.4	0.2433
100	886.7	401.4	71.84	68.6	2.01	1.9	0.3272
125	872.7	388.9	83.24	63.6	3.12	2.4	0.4125
150	859.2	377.0	91.8	58.4	4.48	2.8	0.4991
175	846.2	365.6	97.41	53.2	6.06	3.3	0.5871
200	833.7	354.9	99.99	47.7	7.89	3.8	0.6764
225	821.5	344.6	99.44	42.2	9.95	4.2	0.7671
250	809.6	334.7	95.68	36.5	12.25	4.7	0.8591
275	798.1	325.2	88.6	30.8	14.79	5.1	0.9524
300	786.8	316.1	78.1	24.9	17.56	5.6	1.0472
325	775.9	307.4	64.1	18.8	20.58	6.0	1.1432
350	765.2	299.0	46.49	12.7	23.83	6.5	1.2407
375	754.7	290.8	25.15	6.4	27.33	7.0	1.3395
400	744.5	283.0	0.0	0.0	31.07	7.4	1.4397
425	734.5	275.5	-29.08	-6.5	35.06	7.9	1.5413
450	724.7	268.2	-62.2	-13.2	39.29	8.3	1.6443
475	715.1	261.1	-99.47	-20.0	43.77	8.8	1.7487
500	705.6	254.3	-141.01	-26.9	48.51	9.3	1.8546
525	696.4	247.6	-186.93	-34.0	53.5	9.7	1.9619
550	687.3	241.2	-237.35	-41.2	58.75	10.2	2.0706
575	678.4	235.0	-292.41	-48.6	64.26	10.7	2.1809
600	669.6	228.9	-352.21	-56.1	70.03	11.1	2.2927
625	661.0	223.1	-416.9	-63.7	76.07	11.6	2.4059
650	652.5	217.4	-486.61	-71.5	82.39	12.1	2.5207
675	644.2	211.9	-561.48	-79.4	88.97	12.6	2.6371
700	636.0	206.5	-641.64	-87.5	95.84	13.1	2.7551
725	627.9	201.3	-727.25	-95.8	102.99	13.6	2.8746
750	619.9	196.2	-818.45	-104.2	110.42	14.1	2.9958
775	612.1	191.3	-915.39	-112.8	118.14	14.6	3.1186
800	604.4	186.5	-1018.23	-121.5	126.16	15.1	3.2432
825	596.8	181.9	-1127.14	-130.5	134.48	15.6	3.3694
850	589.4	177.4	-1242.28	-139.6	143.11	16.1	3.4973
875	582.0	173.0	-1363.82	-148.8	152.04	16.6	3.6270
900	574.8	168.7	-1491.95	-158.3	161.29	17.1	3.7585
925	567.7	164.6	-1626.84	-167.9	170.86	17.6	3.8918
950	560.7	160.5	-1768.68	-177.8	180.75	18.2	4.0270
975	553.8	156.6	-1917.67	-187.8	190.97	18.7	4.1640
1000	547.1	152.8	-2074.01	-198.1	201.53	19.2	4.3030