

PRECISION RIFLEMAN

SEPTEMBER 2017

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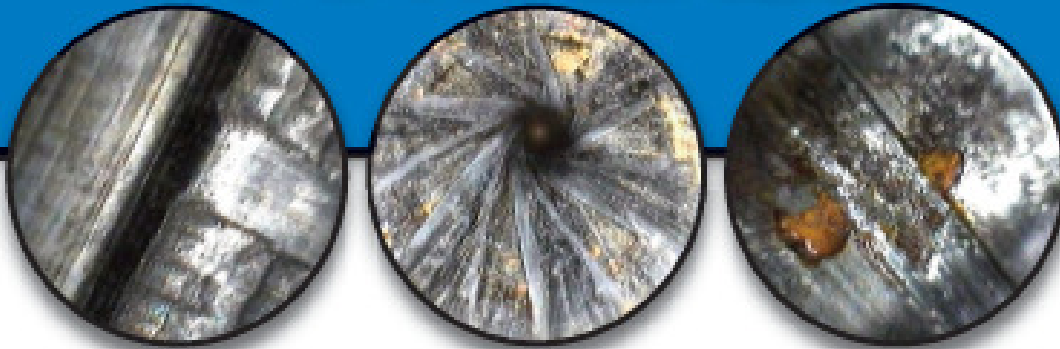


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Chuck Green Wins Western Wayne.....On The Cover

Photo Credited To Bill Gammon

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HVR, no options for Model 7 or XR-100 only.....	\$187.00
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Bruno Arbor Press SALE.....	\$88.85
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WWCC A - "SPRING TUNE UP"

FRONT COVER-The weather up to the match was horrible. I think we had 3" of rain on the Thursday before the match, which was the first match of the Eastern Region, but we survived.

The 2 days of the match was perfect, about 37 degrees in the morning warming up to 74 in the afternoon. I got there on the Sunday before and Dana came up on the Monday. Old friends to talk to, it was good.

Anyway Chuck Green was on a roll, Chuck is an accomplished photographer who travels all over the world taking pictures and shooting Benchrest, when he feels like it. Fortunately this was the weekend he was shooting Benchrest. Chuck was 2nd in the LV 100yd, 1st in the LV 200yd, to give him the grand LV and in the HV 100yd he was 9th and in the 200yd, he was 7th to give him 9th in the Grand which was enough to give him his 1st-2 Gun. The two screamers shot on that weekend was Lee Hachigian with a .075 at a 100yds, and a .190 shot at 200yds by Bill Gammon.

All in all it was a good match. Looking forward to the "Lowell Hottenstein" Memorial on June 10 and 11. Everyone who attends and shoots at this match will be given a folder depicting Lowell's life as written by Barb Hottenstein. Hope to see you then.

Bill Gammon



LEFT-RIGHT HV: Lee Hachigian, Ted Heinselman, Jack Neary, Chuck Green, Bill Gammon, Tim Bassham



Michigan State

LV 100

Jack Neary.....	2094
Chuck Green.....	2154
Pat Metcalf.....	2192
Victor Potts.....	2286
Steve Theye.....	2354

Small Group

Chuck Green.....	1030
------------------	------

LV Grand

Chuck Green.....	2040
Dave Abbott.....	2220
Ted Heinselman.....	2290
Jack Neary.....	2336
Pat Metcalf.....	2406
Bill Gammon.....	2463
Tim Bassham.....	2466
Peter Smith.....	2561
Don Rosette.....	2682
Ron Bush.....	2734

HV 100

Lee Hachigian.....	2030
Robert Fairbanks.....	2150
Bill Gammon.....	2410
Dave Abbott.....	2512
Don Rosette.....	2583

Small Group

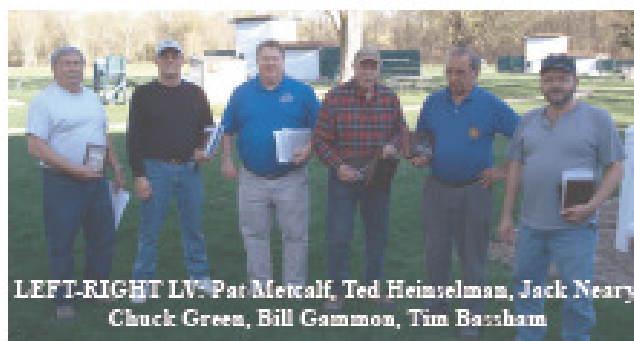
Lee Hachigian.....	.0750
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LV 200

Chuck Green.....	1923
Dave Abbott.....	1948
Tim Bassham.....	1990
Ted Heinselman.....	2003
Bill Gammon.....	2553

Small Group

Bill Gammon.....	1900
------------------	------



LEFT-RIGHT LV: Pat Metcalf, Ted Heinselman, Jack Neary, Chuck Green, Bill Gammon, Tim Bassham

HV 200

Jack Neary.....	2365
Tim Bassham.....	2485
Ted Heinselman.....	2529
Bill Gammon.....	2536
Victor Potts.....	2666

Small Group

Dewayne Wood.....	2580
-------------------	------

HV Grand

Lee Hachigian.....	2397
Bill Gammon.....	2473
Robert Fairbanks.....	2505
Ted Heinselman.....	2581
Tim Bassham.....	2636
Jack Neary.....	2679
Don Rosette.....	2688
Peter Smith.....	2697
Chuck Green.....	2712
Victor Potts.....	2811

2 Gun

Chuck Green.....	2376
Ted Heinselman.....	2435
Bill Gammon.....	2468
Jack Neary.....	2507
Tim Bassham.....	2551
Peter Smith.....	2629
Dave Abbott.....	2630
Robert Fairbanks.....	2668
Lee Hachigian.....	2675
Don Rosette.....	2685



Chuck Green - Winner

OJAI VALLEY GUN CLUB - 600 YARDS

MAY 21, 2015

Great weather for our match this month after a very wet winter. A small turn out this month with some fine results posted by the shooters. Congratulations to Jason Peterson for being the match winner. We would appreciate a call or email to our match director, (Barry Blahm), in advance about your attending the next match the week before the scheduled event. This will help with the set-up in advance of the shoot.

Light Gun - Score

Jason Peterson.....	137
Barry Moss.....	137
Jon Blackman.....	136
Phil Peterson.....	136
Bill Bonser.....	131

Light Gun - Group

Phil Peterson.....	2.3923
Jason Peterson.....	2.3987
Bill Hubiza.....	3.0150
Bill Bonser.....	3.6030
Barry Moss.....	4.0113

Heavy Gun-Score

Barry Moss.....	265
Jason Peterson.....	265
Phil Peterson.....	254
Bill Bonser.....	238
Jon Blackman.....	238

Heavy Gun - Group

Phil Peterson.....	3.3963
Jason Peterson.....	4.4910
Bill Bonser.....	5.0377
Jon Blackman.....	5.3077
Barry Moss.....	6.0843

Two Gun Agg - Score

Barry Moss.....	402-6x
Jason Peterson.....	402-5x
Phil Peterson.....	390-2x
Jon Blackman.....	374-2x
Bill Bonser.....	369-3x

Two Gun Agg - Group

Phil Peterson.....	2.8943
Jason Peterson.....	3.5448
Bill Bonser.....	4.3203
Jon Blackman.....	4.6792
Barry Moss.....	5.0478

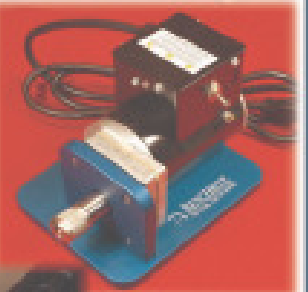
HIGH SCORE LG:	Bill Hubiza.....50
SMALL GROUP LG:	Bill Hubiza.....1.0770
HIGH SCORE HG:	Phil Peterson.....95-2x
SMALL GROUP HG:	Phil Peterson.....2.8420



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JEFF LEWIS WINS MANLEY OAKLEY TROPHY

The Tacoma Rifle & Revolver Club hosted 13 competitors at this year's Manley Oakley SP/HV match on May 5th and 6th. The weather was nice, with temperatures ranging from the mid 40's to the high 50's. And although we started out with overcast skies, the clouds soon gave way to sunshine that lasted all weekend.

On Saturday morning we began with the Sporter 100 yard match, where Jeff Lewis set a TR&RC range record with a small group that measured just .044. But it was Mustafa Bilal's .1946 agg that edged out Jeff's .2002 agg for the win. In the afternoon's Sporter 200 yard match we saw Mike Zdilar shoot both the small group of .260 and the winning agg of .2356. Jeff took second again with a .2459 agg. With two second place finishes on the day, Jeff went on to a convincing win in the Sporter Class with a .2231 grand agg. Steve Kostanich came in second with his .2433.

On Sunday we started with the Heavy Varmint 200 yard match and once again it was Mustafa who won the aggregate with his .2432. Mark Walker's agg of .2721 was second best. Larry Boers shot the smallest group of the morning with his .265. By noon a moderate to strong,

switching wind had developed and the shooting conditions deteriorated. Sighter shots seemed to be of limited use because the conditions changed so rapidly. Despite all that, Larry Boers posted a winning agg of .2224 in the Heavy Varmint 100 yard, though Larry Muller was close behind with a .2244. Jeff shot the smallest group again with a .108. By the end of the day Larry Boers had made the most of the bad conditions and won the Heavy Varmint Class with a .2550 grand agg. Larry Muller was second best with his .2777 grand agg.

When all the targets were completed and the scores were recorded, it was Jeff Lewis who took top honors with his first 2-gun win. Congratulations Jeff, on your winning .2601 SP/HV Grand Agg! Second place went to Mark with a .2770 grand agg.

Thanks to everyone who worked to make the weekend a success. This includes Karen Lynn who called the line, Jim Lynn who kept the target backers moving and our target "crew" Zach Silverton. Next month we break out the rail guns for our HV/UNL-5 Northwest Regional match. We hope to see you there.

Dan Kjelland

Sporter 100

Mustafa Bilal01946
Jeff Lewis.....	.02002
Steve Kostanich.....	.02102
Daniel Kjelland.....	.02142
Larry Muller.....	.02276
Mark Walker.....	.02376
Jim Lynn.....	.02470
Matt Spradlin.....	.02600
Lisa Spendlove.....	.02654
Duane Hatch.....	.02674

Small Group

Jeff Lewis.....	.0044
-----------------	-------

Sporter 200

Mike Zdilar02356
Jeff Lewis.....	.02459
Mark Walker.....	.02543
Steve Kostanich.....	.02765
Jim Lynn.....	.02861
Daniel Kjelland.....	.02950
Lisa Spendlove.....	.03066
Matt Spradlin.....	.03177
Duane Hatch.....	.03217
Mustafa Bilal.....	.03260

Small Group

Mike Zdilar.....	.0341
------------------	-------

Sporter Grand

Jeff Lewis02231
Steve Kostanich.....	.02433
Mark Walker.....	.02459
Daniel Kjelland.....	.02546
Mike Zdilar.....	.02566
Mustafa Bilal.....	.02603
Jim Lynn.....	.02666
Larry Muller.....	.02835
Lisa Spendlove.....	.02860
Matt Spradlin.....	.02889

HV 100

Larry Boers02224
Larry Muller.....	.02244
Duane Hatch.....	.02758
Jeff Lewis.....	.03074
Daniel Kjelland.....	.03236
Steve Kostanich.....	.03350
Jim Lynn.....	.03436
Mark Walker.....	.03440
Mike Zdilar.....	.03450
Lisa Spendlove.....	.03640

Small Group

Jeff Lewis.....	.0108
-----------------	-------

HV 200

Mustafa Bilal02432
Mark Walker.....	.02721
Jeff Lewis.....	.02869
Larry Boers.....	.02876
Mike Zdilar.....	.02879
Jim Lynn.....	.03021
Daniel Kjelland.....	.03038
Steve Kostanich.....	.03146

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Standing (L - R): Larry Muller, Duane Hatch, Mike Zdilar, Larry Boers, Mark Walker, Matt Spradlin, Jeff Lewis
 Kneeling (L to R): Mustafa Bilal, Dan Kjelland, Jim Lynn

Larry Muller.....0.3310
 Duane Hatch.....0.3367

Small Group

Larry Boers.....0.265

HV Grand

Larry Boers.....0.2550
 Larry Muller.....0.2777
 Jeff Lewis.....0.2971
 Duane Hatch.....0.3062
 Mark Walker.....0.3081
 Daniel Kjelland.....0.3137
 Mike Zdilar.....0.3164
 Mustafa Bilal.....0.3184
 Jim Lynn.....0.3228
 Steve Kostanich.....0.3248

2 Gun

Jeff Lewis.....0.2601
 Mark Walker.....0.2770
 Larry Muller.....0.2806
 Larry Boers.....0.2810
 Steve Kostanich.....0.2841
 Daniel Kjelland.....0.2842
 Mike Zdilar.....0.2865
 Mustafa Bilal.....0.2894
 Jim Lynn.....0.2947
 Duane Hatch.....0.3004

Lilja

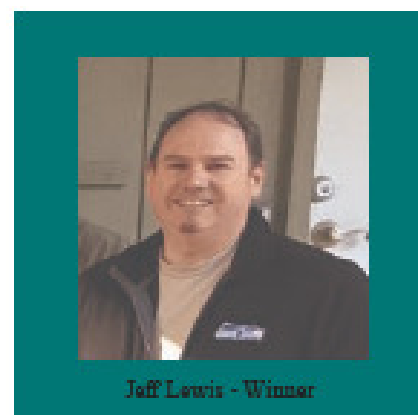
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Greg Swezey



Jeff Lewis - Winner



Washington State

A LOOK AT BULLET IMBALANCE AND TWIST

Bullet imbalance—or more correctly, static imbalance—occurs when the axial center of gravity and center of form of a bullet are not concentric. It is easy to visualize the effect of this imbalance. As a bullet travels through a rifle barrel, it is being rotated about its center of form. When it exits the muzzle of the barrel, the center of rotation shifts from the bullet's center of form to its center of gravity. In mechanics the difference between these two centers is known as the radius of gyration. The bullet will travel in a roughly helical course, a corkscrew type path. Naturally the greater the divergence of the two centers, the greater will be the dispersion of the bullet from the point of aim.

As a bullet leaves the muzzle and is free to rotate about its center of gravity, if imbalanced it will diverge from the axis of the barrel at an angle that is dependant on the twist rate of the rifle barrel. The deviation angle = $\arctan(2e \cdot \pi / T)$ where: e is the radius of gyration and T is the twist rate.

In the November, 1965 issue of THE AMERICAN RIFLEMAN, author E.H. Harrison describes the effects of this imbalance and its relation to rifling twist rate. In his article he derives a formula that calculates the amount of imbalance that will cause one minute of angle (MOA) target dispersion for a given twist rate. The formula is $E = .000046(T)$, where T is the rifling twist rate and E is the amount of imbalance to cause one MOA divergence.

A computer program in Basic was written using the above formula to calculate the effects of a change in twist rate or the amount of bullet imbalance. The figures in the table are from this program. As can be seen from the table, the faster the rate of twist, the greater is the target dispersion. In this example, the amount of bullet imbalance is .0001". The twist rates are from one turn in 8 inches to one turn in 16 inches in one half-inch increments. These rates will cover 95% of the commonly used twists. The values under the heading "Expected 'MOA' Accuracy" are just that. With a bullet with only .0001" imbalance, the best grouping at 100 yards that could be expected are these figures in inches for that given twist rate.

These 'MOA' values are directly related to both the twist rate and the amount of imbalance. If either is doubled, the amount of target dispersion will also be doubled. From the chart it can be seen that an eight twist barrel will cause twice the amount of dispersion (.272 MOA) as a 16 twist barrel (.136 MOA). Likewise, if the amount of bullet imbalance were doubled, all the values under the 'MOA' column would also be doubled.

It is obvious from this chart that two aspects of shooting are quite important. Namely, that we use high quality bullets and the slowest twist that will adequately stabilize that bullet.

It is easy to specify what twist barrel we want to use. It is more difficult, however, to determine the amount of imbalance our favorite bullet has. An obvious cause that comes to mind, in lead core bullets, is bullet jackets that have runout in the wall. It is not quite that simple, though. Let's take the example of a jacket that has .0003" runout, not uncommon in many jackets meant for benchrest shooting. That amount of runout does not translate into .0003" of bullet imbalance.

If the densities of lead and jacket material were the same, the amount of jacket runout would have little or no bearing on balance. They are not the same, though. The Machinery's Handbook, 22nd edition, lists the specific gravity of copper as 8.89 and that of pure lead as 11.34. Lead, then, is about 28% denser than copper. It follows then, that with a jacket with .0003" runout, the area of the jacket wall, on the thin side, that should have been occupied by jacket material has been increased in density by 28%. This will cause a shift in the bullet center of gravity away from the center of form by $.28 \times .0003"$ or .000084" (eighty-four millionths).

The above value is the approximate radius of gyration. This is an over-simplification but is probably a close approximation of the amount of imbalance. There are formulas in mechanics that allow for the calculation of the true amount of imbalance but they would require exacting measurements of each jacket and bullet shape. Obviously, greater amounts of jacket runout would cause a greater shift in the two centers.

It was mentioned above that if the densities of jacket material and lead were the same that it would matter little on the

balance of the bullet. This is true as far as it goes, but it is known that when the ogive is formed on a bullet, if the jacket is not uniform, the nose of the bullet will yield to the thinner side causing to some extent static imbalance and irregular geometry.

There are other possible causes for bullet imbalance. When a bullet is fired from the cartridge case, it is under a great deal of pressure. Assuming that the barrel groove diameter is no larger than about .0005" over bullet diameter, the bullet will obturate in the barrel, conforming now to the diameter and geometry of the barrel. In the case of an oversized barrel, the obturation is probably not the full length of the bearing surface of the bullet. With a barrel that is the same size as bullet diameter—or undersized—the obturation will be complete and more of the bullet will assume the geometry of the barrel.

All is fine with this situation as long as the barrel is uniform. If the geometry of the barrel is such that the groove depths are not the same, the bullet has now gained static bullet imbalance from the barrel that it did not previously have. There are other possible causes for static imbalance. The lead core may have a flaw, such as a void or air trapped between the jacket and core during core seating. The results are the same.

Another cause of imbalance is a barrel chamber that is not in alignment with the axis of the barrel. The effect is that the bullet enters the rifling misaligned, cocked in relation to the rifling. Again the bullet has gained imbalance from the barrel. In his article, Harrison lists this cause as "yaw" in the barrel.

Besides the above-mentioned cause for imbalance from jacket wall runout, the bullet can obtain imbalance from a swage die that is not geometrically perfect. The bullet may come out of the die less than round, or with an ogive that is not in line with the rest of the bullet. Harrison lists this type of cause as "dynamic imbalance". It also can cause static imbalance.

These imperfections, and the situation mentioned above with the bullet nose yielding to the thinner side, can be measured on a bullet spinner. Runout detected on a bullet ogive will not have a full value effect. That is, .0002" runout does not indicate a bullet that is imbalanced by that amount, part of the reason being that the runout is not on

the outside diameter of the bullet. The closer to the center of form the imperfection is, the less effect it has on balance. A measured runout of .0002" on the body, though, is reason for concern.

As has been pointed out, there are many possible reasons for bullet imbalance. As can be seen from the table a very small amount of imbalance can cause a great deal of dispersion on the target. The values in the table apply only to static imbalance. The values for dynamic imbalance and yaw in the barrel are measurable, but vary with individual bullet form and the amount of imbalance. Lessening the twist rate will minimize the effect from these three causes.

In his article, Harrison lists four possible causes for dispersion as related to twist. They are, as mentioned above, static imbalance, yaw in the barrel, dynamic imbalance (which occurs when the bullets axis of inertia is not in line with its angle of form), and insufficient stability. The effects of the first three are reduced by decreasing the twist rate. The fourth one, insufficient stability, is reduced by increasing the twist.

The danger of going to a twist rate too slow, in the search for greater accuracy, is that accuracy can actually suffer if the degree of bullet stability is too close to the point of instability. Harrison points out that when the stability level is less than about 1.3-1.5 (a value that describes stability; less than 1 is unstable), the first yaw that the bullet makes upon leaving the barrel increases dramatically. This first yaw and its size are directly related to bullet grouping ability. Most benchrest barrels with a 13 or 14 twist have a stability factor of no more than 1.5 shooting conventional hollow point benchrest type bullets.

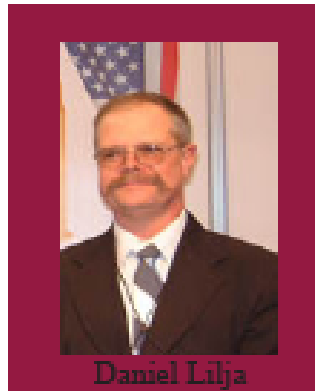
Another danger of a marginal twist rate is from shooting in conditions where there is an increase in air density. This can happen with a decrease in temperature or a decrease in shooting site elevation. Increasing the air density increases the overturning moment applied to the bullet nose as it travels downrange. It is this overturning moment that bullet spin is trying to overcome.

From a practical point of view, the points outlined here apply primarily to benchrest rifles. When trying to shoot aggregates under two tenths of an inch, a built-in disadvantage because of a twist rate faster than optimum can make a difference that is to great a sacrifice. With a hunting rifle though, even one capable of half inch groups, the difference would never be noticed. For example, from the table, a 12 inch twist 30

caliber barrel is in theory, going to shoot a group that is only .036" smaller at one hundred yards than from a ten inch twist, with bullets with .0001" imbalance.

There is also a point of diminishing returns in going to a twist rate on the slow side. For example look at the chart below. The difference in grouping ability between an 8" twist and an 8.5" is .016". But the difference between a 15.5" and 16" twist is just .004". So, my advice is pick a twist that is best for the bullet being used without going too slow and getting a stability factor too close to 1.0.

By: Daniel Lilja



Daniel Lilja

TWIST RATE IN INCHES/TURN	EXPECTED MOA GROUPING
8	.272
8.5	.256
9	.242
9.5	.229
10	.217
10.5	.207
11	.198
11.5	.189
12	.181
12.5	.174
13	.167
13.5	.161
14	.155
14.5	.150
15	.145
15.5	.140
16	.136

COMPUTER CODE IN GWBASIC FOR DETERMINING MOA GROUPING FROM TWIST RATE AND IMBALANCE INPUTS:

```
10 INPUT"ENTER THE TWIST RATE IN INCHES/TURN:";TW
20 INPUT"ENTER THE BULLET IMBALANCE IN INCHES:";IMB
30 MOA=IMB/(.000046*TW)
40 PRINT"MOA=";PRINT USING "##.###";MOA
```



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YELLOWSTONE RIFLE CLUB - SPRING HBR & VFS

The Yellowstone Rifle Club in Billings Montana kicked off its 2017 benchrest season on May 27-28 with a 100/200 yard HBR/VFS match. Temperatures were a bit warm for this early in the season running into the mid-80s with the usual gusty spring winds and a splattering of rain showers off and on. We had 8 competitors in the Hunter Class and 11 in Varmint for Score.

In Saturday morning's 100-yard HBR match Jack Foster was the only competitor to shoot clean and took first place with a 230-10X. Second was Tim Naugle with a 249-11X followed by Bob Lunder in third with a 248-8X. At 200 yards, it was Ryan Lienemann who came out on top with a 244-4X. Gary Evans posted a 243-5X that took second place and Jack Foster came in third with a 241-4X. When the grand agg's were tallied first place went to Ryan Lienemann with a 492-9X. Jack Foster

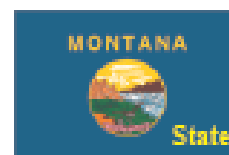
took home the second-place trophy with a 491-14X and Tim Naugle came in third with a 490-12X. Jack Foster had the most X's overall with a count of 14.

We returned to the range on Sunday morning to commence with the 200-yard VFS match. Roger Schuppe quickly established himself as the man to beat with a first-place finish of 249-8X. Bob Lunder was next in line with his 249-6X for second, and tied for third place were Ron Powell, Richard Lynn, and Ryan Lienemann, each with scores of 248-6X. Ron Powell won out the tie-breaker and took home the wood. After lunch, we rotated benches and started up the 100-yard VFS match to round out the weekend. Despite a rain squall and some tricky winds, six shooters put 250 scores on the board. We had a four-way tie for first through fourth place after the fourth target, but Roger coolly punched out all five X's

on his fifth target and sealed up first place with a 250-19X. Ryan Lienemann took second place with a 250-17X and Ron Powell and Gary Evans tied for third with 250-16X, but once again it was Ron who won the tie-breaker.

In the VFS grand aggregate Roger Schuppe got the first-place trophy with a 499-27X. Too bad he dropped that one point on his last bull of the last target at 200 yards. Ryan Lienemann's 498-23X was good enough for second place and Ron Powell took home third with a 498-22X. The most X's for the day went to Roger Schuppe with a count of 27.

I want to congratulate the winners and thank everyone who attended the match. Big thanks also go out to the target and scoring crew, who did an outstanding job throughout the weekend.



Ryan Lienemann
Match Director

VARMINT for SCORE

100 YARD

200 YARD

GRAND AGG

Roger Schuppe.....	250-19X
Ryan Lienemann.....	250-17X
Ron Powell.....	250-16X
Gary Evans.....	250-16X
Jack Foster.....	250-15X
Richard Lynn.....	250-10X
Dave Hallekson.....	249-15X
Bob Lunder.....	249-14X
Rocky Cushman.....	249-11X
Bruce Largent.....	246-07X
Dan Cox.....	245-07X

Roger Schuppe.....	249-08X
Bob Lunder.....	249-06X
Ron Powell.....	248-06X
Richard Lynn.....	248-06X
Ryan Lienemann.....	248-06X
Rocky Cushman.....	248-03X
Dave Hallekson.....	247-07X
Bruce Largent.....	246-06X
Gary Evans.....	245-08X
Jack Foster.....	243-03X
Dan Cox.....	239-06X

Roger Schuppe.....	499-27X
Ryan Lienemann.....	498-23X
Ron Powell.....	498-22X
Bob Lunder.....	498-20X
Richard Lynn.....	498-16X
Rocky Cushman.....	497-14X
Dave Hallekson.....	496-22X
Gary Evans.....	495-24X
Jack Foster.....	493-18X
Bruce Largent.....	492-13X
Dan Cox.....	484-13X

MOST X'S - Roger Schuppe.....19X

MOST X'S- Roger Schuppe.....8X

MOST X'S -Roger Schuppe.....27X

EQUIPMENT LIST

	CALIBER	ACTION	SCOPE	BARREL	GUNSMITH	STOCKER	PRIMER	CASE	POWDER	BULLET
Roger Schuppe	30 BR	Bat	Weaver	Bartlein	Seelye	BAT	Wolf	Lapua	N/A	ERB 119
Ryan Lienemann	30 BR	Bat	Leupold	Krieger	Mulhall	Larson	FED 205	Lapua	H4198/34.5	ERB 117
Ron Powell	30 BR	Bat	Nightfor	Krieger	Hensley	Meredith	FED 205	Lapua	LT30/35.5	Carpenter 110
Bob Lunder	30 BR	Panda	Nightfor	Shilen	Kelbly	Kelbly	FED 205	Lapua	H4198/34.2	Carpenter 118
Richard Lynn	6 PPC	Stolle	Weaver	Shilen	N/A	Self	FED 205	Lapua	LT32/28.0	Barts
Rocky Cushman	30 BR	Rookies	Leupold	Krieger	Rookies	Rookies	Rem	Lapua	LT30/35.0	Berger
Dave Hallekson	30 HBR	Stolle	Nightfor	Lilja	Self	Self	FED	Lapua	N133/40.0	Cheek
Gary Evans	30 BR	Bat	March	Lederer	Self	Self	FED 205	Lapua	H4198	Carpenter
Jack Foster	30 BR	Viper	Leupold	Krieger	Self	Self	FED 205	Lapua	N/A	Carpenter
Bruce Largent	30 BR	Rimrook	Nightfor	Krieger	Borden	Borden	FED 205	Lapua	H4198/34.3	N/A
Dan Cox	30 BR	Panda	Leupold	Paonor	Rookies	Rookies	FED 205	Lapua	H4198	Berger

HUNTER**100 YARD**

Jack Foster.....	250-10X
Tim Naugle.....	249-11X
Bob Lunder.....	248-08X
Richard Lynn.....	248-07X
Ryan Lienemann.....	248-05X
Ron Powell.....	247-09X
Gary Evans.....	243-07X
Dan Cox.....	198-00X

200 YARD

Ryan Lienemann.....	244-04X
Gary Evans.....	243-05X
Jack Foster.....	241-04X
Tim Naugle.....	241-01X
Bob Lunder.....	237-03X
Richard Lynn.....	236-01X
Ron Powell.....	230-01X
Dan Cox.....	191-00X

GRAND AGG

Ryan Lienemann.....	492-09X
Jack Foster.....	491-14X
Tim Naugle.....	490-12X
Gary Evans.....	486-12X
Bob Lunder.....	485-11X
Richard Lynn.....	484-08X
Ron Powell.....	477-10X
Dan Cox.....	389-00X

MOST X'S-Tim Naugle.....11X**MOST X'S-Gary Evans.....5X****MOST X'S-Jack Foster.....14X****EQUIPMENT LIST**

	CALIBER	ACTION	SCOPE	BARREL	GUNSMITH	STOCKER	PRIMER	CASE	POWDER	BULLET
Ryan Lienemann	30 Ld	Kodiak	Leupo	Lilja	Anderson	Anderson	Fed 210	Lapua	N135/41.0	Naugle
Jack Foster	30 Br	Kodiak	Leupold	Bartlein	Self	Self	Fed 205	Lapua	N/A	Carpenter
Tim Naugle	30 X 47	Bat	Burris	Lilja	Gold Cr	Gold Cr	Fed 205	Lapua	N135/42.7	Erb 117
Gary Evans	30 Br	Northwest	Leupold	Krieger	Self	Self	Fed 205	Lapua	H4198/36.6	Carpenter
Bob Lunder	30 Br	Kodiak	Leupold	Hart	Carpenter	N/A	Fed 205	Lapua	H4198/34.2	Carpenter
Richard Lynn	6 Br	Rem Weav	Krieger	Ackerman	Self	N/A	Fed 205	Lapua	Varget	Barts 80
Ron Powell	30 Br	Kodiak	Weaver	Krieger	Carpenter	Self	Fed 205	Lapua	Lt30/35.5	Carpenter
Dan Cox	30 Br	Rem	Leupold	Broughton	Rockies	Rockies	Fed 205	Lapua	H4198	Bib 112



Front Row L-R: Ryan Lienemann, Roger Schuppe, Ron Powell, Jack Foster
 Back Row L-R: Bob Lunder, Gary Evans, Rocky Cushman, Richard Lynn, Dave Hellekson, Dan Cox

THE RETURN OF THE BILLOTTE GANG - SAHUARO

It was them again..... They were back!

We exchanged nervous glances and stepped closer to our guns as they dismounted and strode across the dusty lot, kind of reminiscent of the OK Corral, (a little further east). Only this was more like Quigely Down Under. But now there were three of them, with their "Dead Eye" long range shooting abilities.

Yes, it was the return of the Billotte Gang! These gunslingers had roughed us up on more than one occasion and it looked like they were back to try it again. We were going to have to be careful and stay on our toes. This time, we didn't plan to allow it.

At the February 8:00 AM start time, it was a chilly 39 degrees. Well, we are in the Arizona desert, so can you blame us for putting on coats when it drops below 100?

Another big turn out of shooters was present to not only take on the surly homobres that just showed up, but also to take on the conditions. And it didn't look like they were going to be very merciful either.

Relay one started with five to ten mile per hour winds, building, then dropping and varying from seven to ten o'clock. Not bad, but not easy either. It could get better, or it could get worse as the day wore on. You just never know out here.

There were sixteen sub-MOA light gun groups shot for the day, but only five sub-MOA

aggregates. Bill Warner stepped out front on his own to take on these ruffians like he was the new Sheriff in town, shooting the smallest group of 3.75" and ending up winning with a very nice aggregate of 5.52". He also got the highest single target score of 48-2X. Wow, nice shootin! They don't call him Wild Bill for nothing. But it didn't take long for the Billotte Boys to muscle their way to the front and take over the rest of the match.

Here's the rest of the story for light gun group aggregate. The Gang were right on Bill's heels, Pat Billotte took second with a 7.64", Mike Billotte with a 8.62", and their shifty eyed leader, Jeff Billotte was third with a 8.72" agg.

After that, it was all she wrote. In light gun score (and heavy gun), we all had to holster our guns and slink away as Pat won first place, shooting a 139-1X, Jeff was second with a 139, and Mike put in a 137. I don't really think they shot all that well, it is my opinion that the wind was just too afraid to take them on. It might make them mad.

As we turned to face the conditions in heavy gun, once again we were facing what appeared to be a solid wall of bad guys. The wind was worsening, allowing only four sub-MOA heavy gun groups, but that didn't stop another ambush by.... "Those Guys".

Mike Billotte shot the smallest group of 8.43", and winning with the smallest total

aggregate of 10.04". Pat backed him up with an 11.87", and brother Jeff, providing cover, was third with a 12.04".

For heavy gun score, it was... guess who. Pat Billotte took first with a 271-3X, with brother Mike following close behind with a 269-5X, with him also shooting the highest scoring target, a 98-1X. Once again, Jeff was third with a 247-2X.

The heavy gun scores were fun to watch, First string, Pat shot a 96, Mike shot a 98 and Jeff shot an 83. Second string, Pat a 93, Mike a 96 and Jeff a 94. Third string, Pat an 80, Mike a 75 and Jeff a 68. You could see that the conditions were getting worse. But in the pits, watching the targets, you could tell that these guys were all from the same litter.

You kinda have to look at the equipment list to see if there was anyone else even at this match. Out of the four classes, (light, heavy, group and score), the Billotte Boys were the top three in three of those, and in the top four in the other. They won five of the eight trophies available for the day. With only Wild Bill giving them a run for their money and taking the other three.

After the match, we all headed off to have lunch together, all but the Billotte Gang that is... instead these tough guys went off to see their Mom in Tucson.

Ma Billotte, I suspect she is called. I wonder if she is related to Ma Barker. There seems to be a strong family resemblance.



Lite Gun Agg

Bill Warner.....	5.52"
Pat Billotte.....	7.65"
Mike Billotte.....	8.63"
Jeff Billotte.....	8.73"
Steve Everson.....	9.65"
Lon Persun.....	10.60"
Wayne McDonald.....	11.33"
John Benz.....	44.69"
Steve Brown.....	13.17"
Jerry Riesdorff.....	14.75"
Dale Arenson.....	13.96"
Ed Schwenn.....	18.38"
Ross Herriok.....	32.92"

Small Group - Bill Warner.....3.75"

Heavy Gun Agg

Mike Billotte.....	10.04"
Pat Billotte.....	11.86"
Jeff Billotte.....	12.04"
Bill Warner.....	12.86"
Dale Arenson.....	17.35"
Jerry Riesdorff.....	25.83"
Steve Everson.....	29.44"
John Benz.....	34.15"

Small Group - Jerry Riesdorff.....9.5"

LITE



HEAVY

Lite Gun Total Score

Pat Billotte.....	139-0x
Wayne McDonald.....	130-0x
John Benz.....	128-3x
Lon Persun.....	121-0x
Steve Brown.....	114-0x
Steve Everson.....	105-0x
Ed Schwenn.....	101-0x
Jerry Riesdorff.....	88-0x
Dale Arenson.....	84-0x
Ross Herriok.....	46-0x

High Score - Bill Warner.....48-2x

Heavy Gun Total Score

Pat Billotte.....	271-3x
Mike Billotte.....	269-3x
Jeff Billotte.....	247-2x
Bill Warner.....	230-0x
John Benz.....	203-0x
Ross Herriok.....	175-0x
Jerry Riesdorff.....	157-0x
Steve Everson.....	144-0x

High Score - Mike Billotte.....94-2x



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2017 NBRSA Registered Matches

SOUTHWEST REGION

Sept 2-3	4Gun200	Palomino Valley NV State LR
Sept 2-4	SP/LV/HV 100/200	CANCELED: Visalia Sportsman Club California State Championship
Sept 9	LG/HG 1000	Sahuaro 1000-Yd Benchrest
Sept 9	LG/HG 600	Tehama Shooters, Red Bluff, CA Inaugural LR benchrest match
Sept 17	LG/HG 600	Ojai Valley Gun Club
Sept 24	LG/HG 600	Sloughhouse LR Benchrest
Sept 23-24	SP/UNL 200/100	Palomino Valley Gun Club Nevada State Championship
Sept 23-24	VFS/HBR 200/100	Desert Sportsman Club
Oct 7-8	LV/HV 200/100	Sloughhouse Benchrest
Oct 7-8	4Gun 300	Palomino Valley NV State LR
Oct 7-8	LV/HV 100/200	Arizona Benchrest Club
Oct 14	LG/HG 1000	Sahuaro 1000-Yd Benchrest
Oct 21-22	UNL/UNL 100/200	CANCELED: Visalia Sportsman Club Visalia Invitational
Oct 21	VFS 100/200	Palomino Valley Gun Club
Oct 22	LV/HV 200	Palomino Valley NV State
Oct 22	LG/HG 1000	Sloughhouse LR Benchrest
Oct 28-29	VFS/HBR 200/100	SW Regional Championship Desert Sportsman Club
Nov 4-5	SP/UNL5 100/200	Arizona Benchrest Club
Nov 4-5	LV/HV 200/100	Sloughhouse Benchrest
Nov 11	LG/HG 1000	Sahuaro 1000-Yd Benchrest
Nov 19	LG/HG 600	Ojai Valley Gun Club
Nov 26	LG/HG 600	Sloughhouse LR Benchrest
Dec 2-3	UNL/UNL5	Arizona Invitational Arizona Benchrest Club
Dec 9	LG/HG 1000	Sahuaro 1000-Yd Benchrest

NORTH CENTRAL REGION

Sept 2-3	LV/HV 100/200	Prairie Dog Target Club HV leg of South Dakota State & Butch Kimmel Memorial
Sept 10	VFS 100/200	Buffalo Outdoor Rifle Club, WY
Sept 16-17	HBR/VFS 100/200	Boone Valley Ikes, Madrid, IA
Sept 30-Oct 1	LV/HV 100/200	Minnetonka Game & Fish Club Jerry Simison Memorial
July 8-9	UNL/UNL 100/200	Northern Colorado Benchrest UNL leg of NorCO 4-Gun

MID-CONTINENT REGION

Sept 2-3	LV/HV 100/200	Mill Creek's Kansas State
Sept 9-10	LV/HV 100/200	30th Annual Firewalker Northern CO Benchrest Club
Sept 30-Oct 1	LV/HV 100/200	Land's End Benchrest Purple Haze & 3rd leg of 4-Gun

GULF COAST REGION

Sept 9-10	LV/HV 100/200	Llano Estacado Shooters Assn Lubbock, TX Inaugural benchrest match
Sept 10	VFS 100/200	SW Louisiana R&P Club

SOUTHEAST REGION

Oct 12-15	LV/HV 100/200	Brady Knight Memorial / SER 4 Gun
Oct 28-29	LV/HV 100/200	Ted Manning Challenge Roanoke Rifle Club

NORTHWEST

Sept 2-4	SP/LV/HV 100/200	Tacoma Rifle & Revolver Club WA State & Ed Frombach Memorial
Sept 9-10	VFS 100/200 & 300	North Cascades Sportsman Club Washington State Championship
Sept 19-20	LG/HG 600	Rogue Valley Shooting Sports Northwest Regionals
Sept 22-23	LG/HG 1000	Rogue Valley Shooting Sports Northwest Regionals
Sept 23	HBR 100/200	Tri-Cities Metallic Silhouette Club Wash. State HBR Championship
Oct 15	LG/HG 600	Rogue Valley Shooting Sports
Oct 21	LG/HG 600	Tri-County Gun Club, WA

2017 NBRSA Registered Matches

Nov 18 LG/HG 600 Tri-County Gun Club, WA

MISSISSIPPI VALLEY REGION

Sept HBR/VFS Holmen Gun Club
 9-10 100/200 Roy E Oines Memorial match
 Sept 4-GUN 2017 Group Nationals
 18-23 Bench Rest Rifle Club of St Louis
 Oct HBR/VFS Bench Rest Rifle Club of St Louis
 1 100/200
 Oct LV/HV 100/200 Missouri State Championship
 28-29 Bench Rest Rifle Club of St Louis

EASTERN REGION

Sept 3-Gun 100/200 Fairchance Eastern Regionals
 2-4
 Oct LV/HV 100/200 WAWCA Fall Classic
 7-8 *\$4 bench limit. Call to register
 Oct LV/HV 100/200 Shelby County Fall Finale
 21-22



Reminder to all NBRSA members and all NBRSA associated clubs-

Please make sure your memberships stay current.

It is a requirement of the NBRSA that for any club to hold a "registered" shoot that club must be a member of the NBRSA, prior to the match date.

Also any person shooting in any registered match must be a member of the NBRSA, prior to shooting the match.

Should a lapse in membership occur and a potential world record is shot by a person that is not a member, or if the possible record is shot at a club that is not a member at the time the record is shot, the potential new record will not be recognized and will result in the person not being eligible for that record.

A lapse in membership will also stop the mailing of your monthly magazine.

Thank you

for your promptness and cooperation!



ATTENTION READERS

I'm getting a lot of Match Results coming in, Thank-You.

I see a large number of them in PDF formats. Looks like its mostly in the BUGHOLE program. I am working on Steve Lee in getting this fix. I well keep you informed. Please be patient, as I will as well.

I'm still in need of Photos of the winners. If you could PLEASE take a Group picture, along with a single photo of the over all Winner.

As you can see I've been working on putting in Biographies on shooters. If you have a shooter you would like to share a little bit about, feel free to do a little write up, (with their permission of course). What a good way to learn about someone.

Any questions feel free to contact me.



Thank you again for all your Efforts and Support.

Editor in chief,

Nancy Scarborough

A Retraction

Regards to the "Super Shoot" Header in August issue. I apologize for the typo error on page 8.



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NOTICE TO GENERAL MEMBERSHIP

The general membership meeting of the NBRSA will be held during the Group Nationals on Wednesday, September 20, 2017 immediately following the completion of competition for the day. It will be held at the Benchrest Club of St. Louis located at 2280 Kohn Road, Wright City, MO 63390. Please plan on attending. Agenda items up for consideration at the meeting are listed below.

**Eastern Region Agenda Items:**

None.

Gulf Coast Agenda Items:

1. Should NBRSA have a standard, "Shooter Registration Form" for all registered matches which is to be completed by all participants? If so, what information should this form entail? (Scott Hunter).

Mississippi Valley Region Agenda Items:

1. Board discussion on target paper. (Bud Mundy).

North Central Agenda Items:

None.

Southeast Region Agenda Items:

None.

Mid-Continent Region Agenda Items:

None.

Southwest Region Items:

1. Consider changing the "Unlimited" format for the Nationals to a 6 match-10 shot contest. Include a warm-up match and 5 records matches. Use the usual 100 yard followed by 200 yard procedure. Provide a 2 year trial period with final acceptance/rejection at the end of the trial period. Submitted by Tom Libby.

**2017 Agenda Items for the
Board of Directors**

Replace the current unclear description of what constitutes a Regional "Unlimited" Championship Tournament with the wording used in earlier rule books (e.g. "Regional Unlimited Championship Tournaments shall be five ten shot matches at 100 yards and five ten shot matches at 200 yards..." taken from 27th edition rule book). If not acceptable, provide information as to when the change in the unlimited regional event rule was revised and approved and the reason for the change. Submitted by Dave Tunbridge.

Northwest Region Items:

None.

President's Items:

1. Board to consider eliminating the 50 bench requirement for a range to host a Group National event.
2. Board to consider allowing the Directors to appoint their Alternate Director instead of them being elected.
3. Board to consider whether a membership renewal should be dated the actual due date or the current month that it is processed.
4. Board to consider who should be paying the credit card processing charge fee – NBRSA or member/advertiser.
5. Board to consider who pays for

the postage when a member does not receive a magazine but magazine was mailed to the correct address (lost in mail, etc.) or the membership has expired.

6. Board to consider selling magazines to advertisers/members to sell.

7. Board to consider a situation where someone wants to receive the magazine but does not want to join NBRSA.

Bids for 2019 National Events

Bids for 2020 National Events





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Secrets of the Houston Warehouse

Many, many years ago, when the earth was young, and the oceans still covered much of the land, and dinosaurs were to be found on every street corner... okay, if you insist on a date, it was 1993... we published the first of five Special Issues... and in a burst of creativity, we elected to call this one "Special Issue No. 1". Unfortunately, the first two Special Issues are long since sold out, and those few that infrequently come on the market often carry price tags that look like the Gross National Product figure of some third world country. That first issue carried an article by Dave Scott that we still receive a dozen or more calls a month asking for copies of. After a half dozen calls this week, we have decided to save ourselves a lot of wear and tear on our photocopier, and reprint the article... one of the most popular, and most quoted pieces that we ever carried.)

In 1975, when a Houston concrete contractor opened the doors of his new business venture, the event didn't exactly make ripples among the benchrest community. The project, an enormous warehouse on Houston's east side, was built solely to be leased for industrial storage. And if the event went unnoted, its builder, Virgil King, was equally unknown to group shooters. No one could have predicted that the Houston Warehouse and Virgil King would write one of the more fascinating chapters on the subject of extreme rifle accuracy.

From the beginning, the warehouse was

utilized as planned. First, tons of telephone directories were stacked on its floor; then an oil company leased the structure to store plastics.

All the while, Virgil and a neighbor, veteran shooter Bob Fisher, were kicking around an interesting idea. Even though the building was in full use, it had an unobstructed fire lane that was 30 feet wide and ran the full length of the mammoth structure — 325 yards. Moreover, although employees of the leasing oil company were in and out during the work day, the building was deserted nights and weekends. Virgil saw an opportunity to test his most accurate gun, a Shilen barrel .25/06 hunting rifle, in ideal shooting conditions.

Bob Fisher, a benchrest shooter, had other things in mind. He was awed when first he stood in the enormous warehouse. The floor was thick concrete, poured to withstand hundreds of tons of storage. The walls were 6" concrete without windows. The roof soared 45 feet above floor level. In short, it was obvious to Bob that this building had the potential of becoming the best shooting environment an accuracy fanatic ever popped a primer in. It literally was a benchrest shooter's dream come true, the Camelot of shooting ranges. Here, the breezes never blew, the mirage never shimmered, the sun never set and the rain never fell. Even the harshness of the weather, either heat or cold, was moderated by the insulating properties of the walls and steel roof.

The two shooters began by constructing

a combination bullet trap and target holder utilizing sand contained between walls of 1 1/2" steel plate and a face of 3/4" plywood. Although the heavy device was mounted on casters, Virgil decided it would remain stationed against a wall at one end of the warehouse. To change shooting distances, the bench would be moved along the fire lane.

The warehouse already had fluorescent lighting throughout, but special illumination would be needed at the target. Bob Fisher, an electrical contractor, wired a mix of mercury vapor and quartz lighting. In combination with the fluorescent lamps, it faithfully reproduced normal outside lighting at the target. With the exception of a portable floor lamp used to eliminate shadows, the lights were mounted on the ceiling to prevent their heat from interfering with sighting.

The two shooters built a sturdy, wooden bench but quickly abandoned it when they discovered that placing a hand on its top displaced the cross hairs at the target. They also committed a major error in constructing the bench and stool as a single unit. Every bodily movement was transmitted to the rifle. The shooters correctly decided there was no point in having a million-dollar shooting range with a two-bit bench.

Determined to convincingly rectify his initial mistake, Virgil poured a massive 700-pound concrete bench consisting of a 6"-thick, steel-reinforced top perched on three legs of 6" steel pipe. To be on the sturdy side, he ran iron rods inside the legs and filled them with concrete. The stool was also three-legged and independent of the bench.

Since this ponderous shooting platform was a tad hefty to be manually hauled about, a heavy industrial caster was mounted on an eccentric at the foot of each leg. Rotated down, the casters allowed the bench to freely roll. With the casters raised, the bench sat solidly on its legs.

With the range now perfected, a minor and somewhat nagging difficulty had to be overcome. In the sealed environment of the warehouse, there was no breeze to dispel the mirage rising from a heated barrel. Because a scope tube's bulk may damage a fragile scope, or the tube itself may heat up and introduce mirage, fanning the barrel with a piece of paper became for standard procedure for a while.

Finally, in a bold stroke of technological innovation, Bob brought in a small electric fan. Carefully directed over the barrel, the puny appliance effectively cleared away the barrel mirage. Care was exercised, however, not to allow errant air movement to invade the sensitive muzzle area and thereby deflect the bullet from its true path.

And so began perhaps the most insightful, revealing experimentation into practical rifle

SHILEN HAS MORE TOP 10 WINS IN THE HISTORY OF THE PROFESSIONAL SHOOTING LEAGUE, THAN ALL OTHER BARREL MANUFACTURERS COMBINED.



accuracy ever conducted. Over a period of six years, the levels of accuracy achieved in the Houston Warehouse went beyond what many precision shooters thought possible for lightweight rifles shot from sandbags and aimed shot-to-shot by human eye. For the first time, a handful of gifted, serious experimenters — armed with the very best performing rifles (with notable exceptions) — could boldly venture into the final frontiers of rifle accuracy, a journey made possible by eliminating the baffling uncertainties of conditions arising from wind and mirage.

Under these steel skies, a shooter could, without question, confirm the absolute limits of accuracy of his rifle, or isolate the source of a problem. In the flawlessly stable containment of the Houston Warehouse, only four general categories of accuracy problems were possible: the rifle, the scope, the load or the shooter. For the first time, a very few exceptional rifles would display the real stuff, drilling repeated groups measuring well below the unbelievably tiny .100" barrier. The bulk of rifles, however, embarrassed their owners.

For the most part, shooters arrived at the warehouse with troubles. Their rifles were inconsistent — one group in the teens, the next in the .3's — for reasons they could not fathom. Others had consistent .25" to .30- something rifles, an accuracy level guaranteed to put a competition shooter down near the bottom of the pack. With the list of potential problems significantly narrowed by the elimination of moving air and dancing heat waves, the answers were easier to isolate in the warehouse, and shooters drove hundreds of miles or flew into Houston to get to the source of their tribulations.

Some of the best benchrest marksmen in the nation showed up with rifles they hoped would somehow perform much better in Virgil's concrete sanctuary than out there where the flags flutter. Still others wanted merely to shrink the bullet dispersion of a superb rifle a few additional thousandths of an inch by careful tuning, a task that could not be accomplished at an outside range cursed with the vagaries of natural conditions. Some departed enlightened. Others stalked away disgruntled.

The discoveries made there, some reported in Precision Shooting by T.J. Jackson, were sometimes controversial, but always fascinating. Circulating around at that time were muttering that the warehouse conditions were flawed and the shooting there invalid. From what I knew about the warehouse, I wondered how anyone could fault it. After all, some of the shooters were firing numerous consecutive groups measuring "in the zeros". Flawed conditions, indeed!

For those of us who are strangers to groups "in the zeros", we're talking about 5 shots at 100 yards that are, at first glance, indistinguishable from a single shot. The bullets sizzling through the same hole merely worry away the tortured edge of the target paper in varying degrees until the hole is enlarged less than .100" over bullet

diameter. Often much less.

For years, many of us expectantly thumbed through the pages of Precision Shooting, searching for more information from the Houston Warehouse. Col. Jackson, a highly respected benchrest shooter and gunsmith who frequented the warehouse, occasionally dropped us a crumb — and sometimes a bomb. But it was never enough. In late 1985, two years after the warehouse mysteriously passed into obscurity, a frustrated Dave Brennan confessed that one of the great disappointments of his editorship was that he had never received a comprehensive write-up on the shooting that went on there.

In 1983, as suddenly as it all began, the Houston Warehouse shut its doors to the men who mysteriously arrived in the night. The gunshots faded away. And with them died the hopes of many of us. Now we might never know what happened behind those sturdy concrete walls. Gone was the possibility, however remote, that any one of us would ever sit at the massive bench and launch a bullet into perfectly still air. With sinking hearts, we realized it was the end of an era that might never come again.

In June of this year, I contacted T.J. Jackson in Austin and asked if he would consent to an interview on the Houston Warehouse. T.J. graciously offered to help, but suggested I contact Virgil King, since only Virgil was present every time shooting occurred in the warehouse. T.J. had reported in PS that Virgil was the primary shooter. Col. Jackson described him as having a superior delivery — "delivery" meaning bag technique, or the mechanical ability to return, position and fire the rifle identically each time. Unfortunately, T.J. had no idea how to contact Virgil.

Three nights after I talked to T.J., the phone rang at 9:45. The caller introduced himself as the caretaker of the Houston Warehouse. Virgil had read my recent Precision Shooting article on neck clearance and wanted to discuss some of his thoughts on that subject. Somewhat stunned at this fortunate coincidence, I listened intently for over an hour as Virgil spoke of case necks, shooters and the Houston Warehouse experience. Finally I asked if he would be agreeable to an interview. He was reluctant, but at least I managed to obtain his phone number.

A couple of weeks later, after several abbreviated conversations with his answering machine, I reached him again. This time, Virgil kindly consented to sparing me a couple of hours to tape a conversation on shooting and the warehouse. In order that neither of us spend all morning driving, Virgil suggested we meet about halfway between our homes — at Shilen Rifles in Ennis, Texas.

On the appointed day, Ed Shilen, a mutual friend of Virgil's and mine, introduced us, then departed for an afternoon of sailplane soaring. In the quiet of Ed's office, Virgil began to vividly sketch what many of us had tried to envision. He spoke with great clarity and sharp memory of events that concluded a decade ago.

"The shooting would generally start about 10

at night," he began. "Everything settled down, and the air got real still. It just felt right. Then it was like shooting outside, except there was no wind or mirage. If you had a rifle that would shoot, it would shoot. If you didn't, you found out pretty soon that you had a problem."

"Downrange at 100 yards," he continued, "if a rifle was really cooking, through the spotting scope you'd see the hole in the target open up black when the bullet passed through, then the paper would spring back and close a little bit. And if the group was .035" or so, you couldn't see the difference between it and one bullet hole through a 36X spotting scope."

A unique feature of the Houston Warehouse was the fact that it indeed had similarities to shooting outside. Unlike shooting tunnels, where the shooter must wait between shots for powder gases and heat to clear, firing in the vast expanses of the warehouse could be conducted at any pace. The offending products of combustion rapidly floated to the roof, high above.

As already indicated, of the handful of riflemen who ever fired in the warehouse, a high percentage had problems. On occasion, experimentation would continue all night or all weekend, as a shooter refused to accept the fact that his rifle simply was not going to perform. When this occurred, Virgil and his shooting guest spread cardboard on the hard warehouse floor and rested periodically, then went back to it again.

"It was pretty frustrating," Virgil admitted, "because in the warehouse I could fire three groups in any rifle and tell you if that rifle was going to shoot really well."

"Still," Virgil explained, "I felt that I owed any shooter who either drove hundreds of miles or flew into Houston the opportunity to prove to himself that his rifle just was not going to shoot. If that took hours or days, that's the way it was going to be."

Numbered among those who showed up with rifles not measuring up to expectations were distinguished personages such as Don Geraci, Harold Broughton, Ed Shilen, Frank Wilson, Henry Christman, John Jones, Wilbur Cooper, Col. Jackson, Jim Goddard, Jim Williams, and Bob Fisher. Most of the disappointed shooters reworked their equipment and returned. Those who returned generally trotted out vastly improved guns.

That's not to say that the bulk of rifles showing up there — even the reworked ones — would shoot in the zeros. Virgil estimated he could count on his fingers the rifles he had seen that would consistently shoot to this awesome accuracy level. T.J. Jackson owned two such rifles, both chambered by him for 6BR. One of his rifles, a Henry Varmint class gun, consistently shot .050". The other, a lighter rifle, would hold at about .060". T.J. also built an exceptional 6PPC for a customer, which T.J. later purchased. Why? We can assume part of the reason is that it grouped at the .050" level. Frank Wilson had two rifles that would shoot in the zeros, but only after they had been reworked.

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"We figured any gun was really shooting," Virgil explained, "when it would shoot five consecutive groups that were identical in shape and less than .080".

The most accurate rifle ever to punctuate the stillness of the Houston Warehouse happened to be Virgil King's own 10 1/2 pound Light Varmint benchrest rifle. The rifle was built around an action made to Virgil's specifications by Houston shooter Wilbur Cooper, a mechanical engineer, master machinist and faustical perfectionist. The action was machined from #416 stainless steel and had an integral sleeve extending 5/8" forward around the barrel, but not touching it, to provide additional bedding surface. Virgil said the tolerances were held so close in this action that he estimated, as an example, that the clearance between the bolt and boltway measured perhaps a minuscule .0001" on all sides. Consequently, simply inserting the bolt took a measure of concentration.

T.J. Jackson chambered its Shilen Select Match Grade 8 groove barrel for a .050"-shortened version of the 22PPC. He also turned the outside of the barrel to ounce-saving dimensions which permitted an oversized #7 contour to be used without the rifle exceeding the weight limit for Light Varmint class. The barrel was cut to 21 3/4" and target crowned.

Lapping compound was then smeared on the barrel threads, and by applying outward pull, the barrel was lapped into the action threads for full, positive contact. Virgil pointed out that if this procedure is not accomplished, only one thread or parts of one or several threads may be making contact. Anything less than full thread contact, he underscored, is destructive to finest accuracy.

During the lapping operation, great care was exercised to align the barrel straight with the receiver. Virgil used no mechanical means. He simply used his hands and a delicate degree of "feel". He stressed that this step should be done with great moderation. A little lapping here goes a long way.

Part of the reason for lapping-in the barrel and receiver threads is to help center the barrel in the precise middle of the receiver. The superb precision gunsmiths who build benchrest rifles correctly cut the barrel threads slightly loose.

While this serves several essential purposes, there is no guarantee that the barrel will "center" when it's run up and tightened. Lapping helps eliminate this uncertainty.

Virgil confessed that lapping would not have been necessary on his rifle if he, Wilbur Cooper and seasoned shooter John Jones had not been tardy in developing an important innovation in the mating of the barrel to the receiver. Too late to benefit Virgil, the three jointly conceived the idea of undercutting a 45-degree slope on the inside edge of the receiver ring, leaving about two-thirds of the receiver shoulder untouched and square. Another 45-degree slope, cut farther inside the receiver (on a Cooper action), terminated at the locking lugs. With the barrel precisely cut to snug up against the two sloped areas, as well as the receiver shoulder, perfect barrel centering became absolute and positive.

With the lapping done, Virgil next disassembled his Burns conversion Remington trigger and polished it to a mirror-smooth finish, setting it at a delicate 1/4 ounce. He also specified that the firing pin spring inside the bolt be as strong as feasible.

The barreled action was zero-tolerance bedded and then glued in a McMillan stock. Two action screws were also installed in place. In tuning this finely accurate rifle, Virgil firmed up the middle screw to correct a tendency for slight vertical dispersion.

He mounted a Lyman-Siebert 30X scope in Bausch & Lomb rings that had been painstakingly lapped so only a tiny amount of cross hair correction was needed to bring the gun on target. The rings were set on Weaver bases.

The finished rifle made its weight limitation by the skin of its teeth, which did nothing for the appearance of this exceptional gun. Spraying the stock would have catapulted it into the Heavy Varmint ranks. Therefore, the stock permanently retained its unfinished fiberglass appearance.

If the rifle looked like the devil, it shot like the hammers of hell. "Day after day, week after week", Virgil recalled "it would NOT shoot a group in the warehouse bigger than .070". You had to check it or thumb it to get it to shoot that big. Generally, it shot .035" to .050", with most groups holding around .035". But now and then

you'd sneak one in a little better than that."

Friends, we're talking about firing group after group approximately the same size as the gap on your spark plugs. This, with the barrel cleaned between every six shots — one group plus one fouler. But didn't he get an occasional larger group? Something really horrible, something maybe in the (shudder) teens? "Not unless you did something wrong," Virgil responded indignantly, flinching at the implication of his rifle sinking to that dismal level.

How could the rifle and the man behind it be that consistently accurate? Virgil told me in great detail. "First, you shoot free-recoil. After a while, after all the thousands of rounds I fired in the warehouse, I developed a technique that was practically infallible. I did exactly the same thing every shot. I was like a machine, and once you find out what works, you don't change anything. We discovered that if you want a gun to really shoot, you can't cheek it, you can't shoulder it, you can't hand it, you can't thumb it. The only thing you touch is the trigger, and I tried to put my fingerprint on the trigger exactly where my last fingerprint was. I didn't even touch the bench. I planted my feet solidly on the floor and kept them right there.

"Your shoulder should be 3/16" to 5/16" from the stock so you can catch the rifle immediately when it recoils back," Virgil advised. "Otherwise the rifle will get back too far and disturb the rear bag."

The rear bag and the way you manage it is crucial, Virgil explained. First, he positioned the rifle on the bench so the stock barely protruded from the "V" of a rabbit-ear bag, then he pounded the stock firmly into the bag. As already mentioned, when the rifle recoils, it's important that the bag stay put. With proper bag technique, when the rifle is returned to its firing position, any sight corrections should be slight and made by tiny manipulation of the rear bag. The less bag adjustment, the better. Consistency is everything.

Virgil packed his rear bag very firm with casting sand, which is about 33% heavier than common sand. He then applied water and formed the "V" to the rifle stock by pounding the stock into the bag and allowing the leather to dry. Done only once, this step hardens the leather and makes the stock slide smoother. A mixture of equal amounts of talcum powder and white graphite applied to the back and front bags provided smooth sliding of the rifle, even in very humid conditions.

He packed the front bag as hard as iron. Here he employed a one-to-three mixture of Portland cement and casting sand. The cement doesn't set, but it does help hold the bag shape by resisting the twisting force imparted to the fore-end by bullet torque.

Virgil fired his many zero-level groups without any side support for the front bag, but he strongly advocates the pedestal fore-and-stop. He adjusted the stop so the front bag supported the fore-end about halfway from the

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end of the fore-end to the receiver. He said if the bag is positioned farther forward, this part of the stock is too springy, and accuracy will suffer.

When Virgil returned his rifle after firing, he bumped the fore-end stop and then pulled the rifle back "one-millionth of an inch". In the warehouse, he found that contact between the stop and stock tended to deteriorate accuracy.

The Houston Warehouse was the perfect setting for building a load. In years of watching his rifles and a few others punch microscopically enlarged holes in targets, he recorded some interesting observations. "In the summer," Virgil noted, "the sharpest groups we could get out of the 6PPC was with Winchester 748 powder. But when the temperature fell below, say 70 degrees, it wouldn't shoot. We'd have to go to H322." His Gilmore-chambered Shilen 8-groove 6PPC barrel on the Cooper action produced groups a bit looser than the 22PPC barrel, averaging about .070".

In this shortened 22PPC, he used IMR4198 exclusively. He adopted this powder after Don Geraci, an advocate of 4198, visited the warehouse. Although 4198 has a reputation for varying considerably from lot to lot, Virgil never bothered to lay in a big supply of any particular batch. "I just went out and bought some when I needed it," he said. "Lot number didn't make any difference."

Within limits, neither did powder charge. Virgil threw his charges from a Culver conversion, and the grain-cutting operation obviously gave him reasonably consistent results with the long, little kernels, considering the excellence of the resulting groups. He did, however, later use a Belding & Mull powder measure in order to lessen the grain-cutting problem.

Powder charges, as long as they were fairly consistent and bracketed within a couple of grains, were not important, he said. On one occasion, as an experiment Virgil shot one group with his 6PPC barrel on the Cooper action using a 53 Culver setting of Winchester 748, the next 52 and the third 51. All three groups were identical.

He shot the now-discontinued 68-grain Remington Bench Rest Bullets in his 6PPC barrel and 52-grain Remington Bench Rests in the 22PPC. "I decided on the Remington bullet in the beginning," Virgil explained. "I developed my brass to work with it, and I really didn't experiment with any others."

Virgil added that although he never saw an inaccurate primer, he went with the prevailing opinion and used Federal 205M's. They were seated with a Lee tool, and he was unable to detect any accuracy variances resulting from seating pressure. Apparently, as long as the

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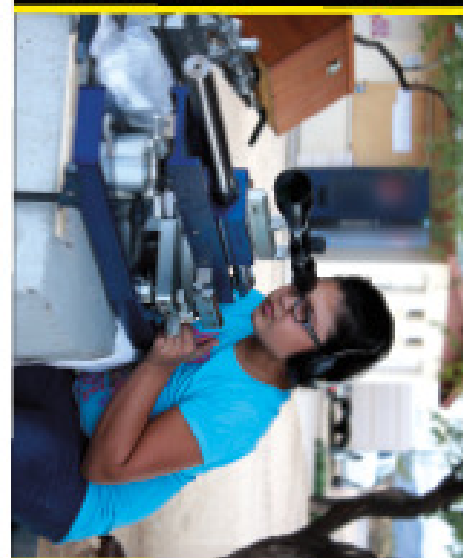
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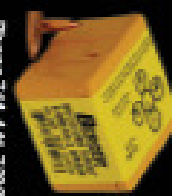
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SHARP SHOOT R PRECISION PRODUCTS

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primer isn't crushed and ruined in seating, nothing else in seating really matters.

One thing that IS important is that the bullet be precisely seated against the lands. T.J. Jackson reported this fact in the May 1987 issue of Precision Shooting. In a letter to the Editor, T.J. wrote, "...in all our testing in that Houston warehouse... and the dozens and dozens of groups that Virgil King shot in there 'in the zeroes'... he NEVER fired a single official screamer group when he was 'jumping' bullets. All his best groups were always seated into the lands, or at the very least... touching the lands." Virgil said his practice was to seat the bullets so the engraving was half as long as the width of the lands. He noticed an interesting phenomenon with rifles that could really shoot: if the bullets were seated a little short and the powder charge was a bit on the light side, the groups formed vertically. As he seated the bullets farther out and increased the powder charge, the groups finally became horizontal. If he went still farther, the groups formed big globs. He said the trick is to find the midway point between vertical and horizontal. That point should be a small hole.

What were the velocities of his loads? Virgil doesn't know or really care. "I didn't work with chronographs," he said, "because as long as a bullet went into the same hole as the previous one, it didn't make any difference how fast it was traveling." He confided, however, that his load of 4198 in the 22PPC was a shade on the warm side.

Building a load is important, Virgil conceded, but "tuning" cases is what stands between you and that final fraction of an inch that separates a good gun from a barn burner. "Tuning" cases goes far beyond sorting, neck turning and prepping the primer pockets and flash holes. These case refinements will get you only so far, Virgil stressed. To produce cases capable of shooting groups better than the guy at the next bench, you have to go the extra mile. And you make the journey with sensitive hands and a piece of #400 sandpaper.

For Virgil, the process started by purchasing a substantial number of Sako .220 Russian cases. (Yes, Virginia, there once was such a case.) After the cases were weight sorted, he annealed the necks with a small propane torch. He then loaded Bullseye powder behind toilet paper bullets and fired the rounds in a special rifle assembled for this purpose. The necks of the fire-formed cases were next inside bored. This was accomplished on a precision lathe, with the necks supported in a die during the operation.

Virgil would then outside turn the necks for a total clearance of about .0007" between loaded round and chamber. Since the neck turner left cutting rings, Virgil sanded the necks shiny smooth, which typically resulted in a somewhat widened neck-to-chamber clearance of .00075". He emphasized that until the hills and valleys were smoothed, the case neck was prevented from laying flat against the chamber.

Flash holes were cut identically and chamfered inside, but he didn't uniform primer pockets or turn the case bases. He also had not the foggiest idea what amount of case-wall variances existed in any of his brass, but in those excellent Sako cases, probably not much.

Then came the final, critical step — the step requiring a sensitive touch and #400 sandpaper — the "tuning" step. "The secret," Virgil said, "is to get the neck tension — the grip of the brass on the bullet — exactly the same on every case. You do this by firing the case and then feeling the bullet slide in the case neck as you seat it. Here, a micrometer won't do you any good. Feel is the whole thing. If any case grips the bullet harder than the others, you take three turns over the sandpaper and fire it again, until you get exactly the same amount of seating pressure. Until the necks were tuned, I didn't feel I was ready to start tuning the gun."

Virgil continued: "You can change the powder charge slightly, and it won't really make any difference, but if you change the bullet seating depth or the grip on the bullet, you're going to see bad things happen fast."

After a case has been fired a couple of times, another condition is created in the neck that requires sensitive feel. A tiny groove pressed into the neck by the pressure ring on a flat-base bullet causes the bullet to "snap" into place when it's seated. Virgil emphasized that feeling the bullet slide down the neck and then snap into place told him everything he needed to know about whether that round was going to go into the group or not.

To sense these critical events, Virgil seated bullets in a Wilson straight-line tool BY HAND — not arbor press. He estimated that the seating pressure on his hand was moderate — perhaps 15 pounds. If seating requires significantly more pressure, the operation damages the bullet's fragile pressure ring, bulging your groups. If the seating pressure is too light, he said you're assured a mediocre .250" rifle.

Virgil did not size his case necks. With about .00035" clearance on all sides between the loaded round and chamber neck, the natural spring-back of the brass, in combination with his neck preparation, correctly gripped the bullets. Some other warehouse shooters, including T.J. Jackson, followed the same practice.

Cases, however, did wear out. Virgil estimated that a case would no longer grip and "snap" to his satisfaction when it had been recycled 20 to 25 times. It was then discarded.

What about barrel life? In the warehouse, more than anywhere else, it could be accurately gauged, because even a tiny loosening of group size would be detected. From his experiences and those of others, Virgil estimated that stainless steel barrels chambered for the common .22 and 6mm benchrest cartridges are pretty well over the hill at 1,000 rounds. But the finest accuracy sharpness of a barrel departs much sooner. Noticeable deterioration may begin at about 700 rounds. He admitted these figures could vary

widely for obvious reasons reflecting barrel care, cleaning technique and cartridge velocity levels.

When a shooter showed up at the Houston Warehouse with a really sick rifle, most often there were no miracle cures. Already, the experienced shooters who came there had pretty much worked out the best loads. Once scope problems had been eliminated, changing powder, bullet seating depth and other factors usually didn't improve things greatly. Only if a rifle arrived shooting in the mid-teens or less did it have the potential of tuning down into the zeroes.

"If a gun was shooting one .250" group and then a .350"," Virgil said, "usually we couldn't help things much. Typically these guns would put three or four bullets in one hole and have the rest hanging out." These were the rifles that often were reworked and then brought back for another round in the warehouse.

Interestingly, a rifle — whether it performs well or horribly — shoots in predictable patterns. In his PS writings, T.J. Jackson observed that in the warehouse an excellent rifle would shoot the same size and shape group time after time. But if you changed anything, such as bullet seating, the size of the group or the shape or both would change. Virgil certainly agreed and added that with a truly flawed rifle he could call every shot, whether left, right, down or up, before he nudged the trigger "The gun follows a pattern every time," he noted. "It shoots the same group in the same order according to the cleanliness of the barrel." In other words, the predictability applied only when the rifle was cleaned between groups.

Virgil pointed out that one of the problems with the 4198 powder used in his highly accurate 22PPC was that it burned dirty. In warehouse shooting, when he was in hot pursuit of zeroes groups, he cleaned his barrel with a bronze brush and solvent after every six shots — one fouler and one group.

But at regular intervals the barrel had to undergo a scrubbing with J-B compound to remove solvent-resistant fouling 3" to 4" up from the chamber. Although the fouling couldn't be seen with the unaided eye, Virgil could feel it with the cleaning rod. With the constriction constantly controlled, the rifle would maintain its keen standard of accuracy. Virgil would have preferred H322 because it was the cleanest-burning powder he tried in the 22PPC. Unfortunately, the rifle was uncooperative.

Runners have persisted for years that some rifles shoot proportionally better at 200 yards than 100 yards, or vice versa. Virgil files that one under "occultism". His experience in the warehouse was, if a rifle was shooting a consistent .100" at 100 yards, it shot a consistent .200" at 200 yards. He admitted, however, that his knowledge here is limited, because in the warehouse they rarely fired at 200 and 300 yards.

Virgil absorbed a wealth of information

from the experienced shooters who visited the warehouse. Don Garaci introduced him to IMR4198. Harold Broughton referred him to Wilbur Cooper. John Jones and Henry Christman instructed him in the proper shooting technique. And there were many other valuable lessons from perhaps the most knowledgeable people in the sport.

But no bit of information was, Virgil believes, more valuable than a little advice Jim Gilmore passed along. Jim said a barrel **MUST** be 21 3/4" long for optimum accuracy. That precise length, he stated, sets up a vibration pattern that duplicates well from shot to shot. Virgil faithfully followed that advice on his guns.

Anyone who strictly observes the 21 3/4" doctrine will screw off a failing barrel of that length and run a new one under it. Recambering and rethreading, in order to achieve more pristine lands just forward of the throat, shortens the barrel. Shorten the barrel, spoil the magic length.

Through the years, the Houston Warehouse shooters were able to rate the relative accuracy of the various benchrest calibers — .22, 6mm and .30. In the perfect conditions of the warehouse, the .22's outshot them all, followed closely by the 6mm's. The .308 calibers were a not-too-distant third. The most accurate .30 caliber ever to find its way into the warehouse also belonged to Virgil. The rifle, built around a Shilen DGA action with McMillan barrel, shot consistently within a few thousandths of .100". The barrel length? You guessed it: 21 3/4".

During the six years the Houston Warehouse

was in use, less than thirty shooters were invited there. Part of the reason for such a small roster of participants was the sheer complications of the situation. First, there was no way Virgil could allow people to come and go as they wished. The warehouse was leased out and filled with thousands of dollars worth of materials belonging to someone else. Then there were always the liability and insurance problems associated with the risks of firearms use.

There also was a ticklish problem concerning the legalities of shooting there. Technically it was against the law, because the warehouse was within the city limits of Houston. When the police knocked on the door — and they did regularly in response to the noise of gunshots — Virgil was often left with some heavy-duty explaining to do. Consequently, of necessity he had to be there any time the warehouse was in use.

To further complicate matters, preparing the range for shooting and then putting everything away was a laborious and time-consuming task, and the shooting itself consumed many hours. Since things usually began late at night, a typical shooting session usually put Virgil home about the time his alarm clock went off.

But frankly, Virgil also is a direct and unpretentious man who expects more honesty and integrity from his acquaintances than most of us. If he had reason to dislike or distrust a fellow shooter, that individual was not going to shoot in the warehouse. And that was that.

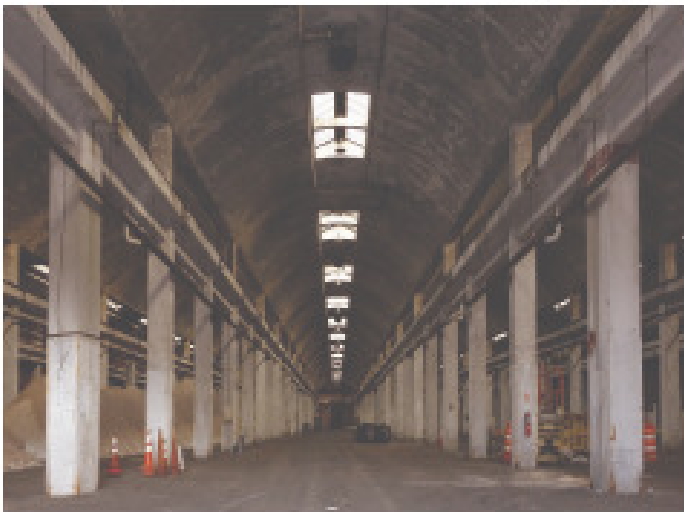
Of the superb shooters Virgil watched while he was shooting competitively, he rates Ron Prachyl of Dallas as the most gifted. "Ron is a real shooter, not a warehouse shooter," he pointed

out. "If Ron had owned my rifle, he would never have lost any match of any type."

If, by the preceding statement, Virgil is suggesting that his own accomplishments and abilities are somehow less than outside shooters, the obvious must be stated. In the warehouse, not even the best competitive shooters in benchrest approached what Virgil was routinely able to do. His long, consecutive strings of zero-level groups, fired over a period of years and witnessed by other shooters, stand alone. Had he pursued competitive shooting with the same dedication and fierce concentration, undoubtedly his accomplishments outside would have been as impressive.

Years of warehouse shooting till the small hours, punctuated by occasional competition, finally took their toll. Although he won matches at Tomball, Lafayette, Lake Charles, New Braunfels, Austin and Knoxville, Virgil eventually confronted the fact that the shooting that used to be such fun had become work. He was burned out. Worse, he found himself habitually grieving over several humiliating encounters with the shooting conditions at Midland. He gave his beloved 22PPC to Ralph Council and slammed the warehouse doors to shooting. He didn't even save any of the remarkable targets.

The keys to the Houston Warehouse still jingle invitingly in Virgil's pocket. The bench, target holder and all-important fan are still there, collecting dust. But although the warehouse stands in readiness, Virgil has no intentions of ever firing there again. That's not to say, however, that he's through with shooting. Now and then he stokes up his Shilen-built .30-06,



These are file photos- not the actual Houston Warehouse, which remains forever shrouded in mystery.

and on his backyard range near Palestine, Texas, fires three shots into an admittedly larger hole than he once was accustomed. Then he goes on to other things, and there's a wide selection of these. Even though he's officially retired, Virgil defines "retirement" as working harder than he ever has at the things he loves to do. That includes his present avocation, raising race horses.

As Virgil was voicing concern over a sick cow at home and the dangerous "killer" horse he regretted having to sell, a customer opened the door of Ed Shilen's office and asked where Ed was. Virgil replied that Ed had left for a local bar and probably would be there all evening. This less-than-accurate answer obviously satisfied the man. As he nodded knowingly and closed the door, Virgil glanced at his watch and jumped to

his feet. He had scheduled this to be only a two-hour interview, and three hours had passed. He had pressing matters back at the house.

As he walked away, I had one final question. "Virgil," I called as he opened the door, "was there a secret you did NOT tell me?"

That stopped him in mid-stride. He stared at me for a few seconds, then broke into a broad smile. "I didn't tell you about how I finally got

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my 22PPC to arc."

"Arc?" I responded dully.

"Arc," he repeated. "There was one final thing I discovered late in the game. It had the rifle down to a consistent .025" in the warehouse."

I felt the sweat pop out on my brow. Now, it was me who did the staring. "Well, are you

going to tell me what it is?" I finally managed to ask in my most persuasive, bordering-on-begging tone of voice.

"It was in the preparation of the brass," he said simply, then turned and walked away.

Now, if my high school math hasn't failed me again, the man just said he had suddenly trimmed those huge, gaping .035" groups by

about one-third!

On a quiet night, when your annoying neighbor has borrowed your latest issue of Precision Shooting you haven't read, and there's nothing but reruns on the tube, that parting shot from Virgil King ought to give you something to think about.

By Dave Scott

(Originally Published in Precision Shooting Magazine "Special Issue No. 1" in 1993).

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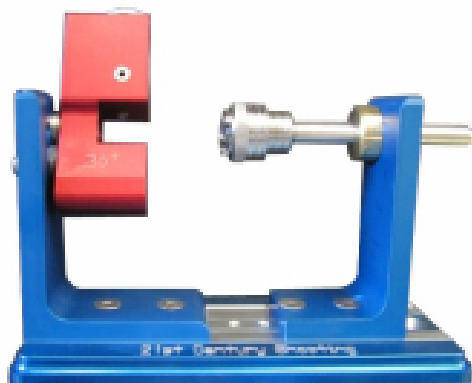
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10801 S 134th St,
 Bennet, NE 68317
 Contact: Mike Shapoval
 402 420-5763
mike10shapoval@windstream.net

Minnetonka Benchrest Assn

8310 Hill n Dale Dr, St Francis,
 MN 55330 www.mgfc.org
 GPS: N45 23.42 W93 29.29
 Call: Scott Moser 612 961-6761
 10412 Abbott Dr, Brooklyn Park
 MN 55443 samoser@comcast.net

Oak Hill Gun Club

www.oakhillgunclubinc.com
 12364 Coon Hunters Rd,
 Blue Grass, IA 52726 563 381-2677
 Call: Jim Schmidt 563 340-4789
jjwonderland325@gmail.com

Prairie Dog Target Club

Call: Don Deckert 605 288-1919
 HC 54, Box 3, Porcupine SD 57772
pdtc57772@yahoo.com

NW—Northwest Region

Rogue Valley Shooting Sports Assn

6900 Kershaw Blvd, White City,
 Call: Phil Grammatica 714 749-7216
philgrammatica@yahoo.com

Lewis-Clark Wildlife Club

27007 South Tom Beall Rd,
 Lapwai, ID 83540 280 843-2987

Ranges, Clubs, and Contacts

www.lcwildlife.org

Contact: Paul Gylling - HTR/VFS
509 553-1118 PGylling@gmail.com
40102 SR 195, Colfax WA

North Cascades Sportsman's Club
PO Box 1721, Chelan, WA 98816
<http://www.chelangunclub.com>
Call: Wally Juneau 509 668-7336
ifish2@methow.com

Tacoma Rifle & Revolver Club
8503 Chambers Creek Rd W
University Place, WA 98467
www.tacomarifle.org
Contact: Jeff Lewis 206 407-8299
32310 6th Ave SW,
Federal Way, WA 98023
varminthunter1@comcast.net
Call: Mustafa Bilal 206 683-3617
mustafa@turkshead.com

Tri-Cities Metallic Silhouette
Hwy 12 to Pasco-Kahlotus Rd
www.tcmsa.org
Contact: Bob Birney
509 531-6151
rebirney@gmail.com

Tri-County Gun Club
13050 SW Tonquin Rd, Sherwood,
OR 97140 Call: Fred Dobson 503
358-2643 or fdobson3@gmail.com

Yellowstone Rifle Club
7212 Molt Rd, Billings, MT
406 656-2775 www.yrc.org
Contact: Ryan Lienemann
406 245-4056
450 Mirabel Ct, Billings, MT 59101
lienemannbr@gmail.com

MV—Mississippi Valley

Bench Rest Rifle Club Of St Louis
2280 Kohn Rd, Wright City, MO
63390 www.shootingstl.com
GPS: N38 53.353 W091 04.763
Joe Fesi - Group 314 800-8921
old4and1@gmail.com
Wayne Corley - Score 636 928-0882
waynecorley@sbcglobal.net

Holmen Rod & Gun Club
W7503 Cnty Road T, Holmen, WI 54636
www.holmenrodandgunclub.com
Contact Craig Nagel 608 783-5522

SE—Southeast Region

Middle Georgia Gun Owners Assn
www.mggoa.com
GPS: N32 24.3732 W82 53.0574
PO Box 4096, Dublin, GA 31040
Contact: Matt Walker 478 304-2749
mggoa1@gmail.com

River Bend Gun Club
588 River Bend Gun Club Road
Dawsonville, GA 30534
770 893-3502 www.rbgc.org
GPS: N34 20.198 W84 14.819
Contact: Jim Andress
PO Box 7, Marble Hill, GA 30148
benchrest@rbgc.org, or
jim@precisionrifles.co
770 876-2351 or 770 893-3319

Roanoke Rifle & Revolver Club
1305 Gun Club Dr, Hardy, VA 24101
www.roanokerifle.com
Contact: Gil Gross 276-634-0082
gilgrosscms@embarqmail.com

MC—Mid-Continent Region

Land's End Benchrest Shooters
Range Address: 3520 Reeder Mesa
Road, Whitewater, CO 81527
Contact: Tom Stiner 970 257-9160
TSTooling@hotmail.com

Mill Creek Rifle Club
7215 Gardner Rd, DeSoto, KS 66018
www.millcreekrc.org
Contact: Dan Creach - Group
816 586-9475 dcjcreach@aol.com
Contact: Howard Cower-HTR/VFS
913-287-7977 hcowher@kc.rr.com

Northern CO Benchrest Shooters
38967 CR 51, Eaton, CO 80615
www.wcfw.org
Contact: Bud Schalles 970 224-3740
PO Box 83, La Porte CO 80535
budshalles@aol.com

Okie Shooters Range
Contact: John Dumas 580 670-1996
107 N Main St Apt B, Tonkawa, OK
74653 jack.dumas@aol.com

Ouachita Sportsmen's Assn
Call: Ray Porter at 870 633-8984
278 Moquire Ln, Pencil Bluff AR 71965

Whittington Center
34025 US 64, Raton, NM 87740

575 445-3615 www.nrawc.org
Contact: Mark Matsko 505 643-6667
8824 Henriette Wyeth Dr NE, Al-
buquerque NM 87122
email: mmmatsko@gmail.com

SW—Southwest Region

Arizona Benchrest Shooters
GPS: N33 27 12.22 W112 37 12.20
<http://azbrs.com>

Call: Ryan Neal 480 240-6792
ryan.neal@abmammo.com

Central Utah Benchrest
Call: Dave Tunbridge 801 571-6755
drtunbridge@gmail.com

Desert Sportsman Rifle Club
www.dsrpc.net
GPS: N36.1498 W115.3653

Contact: Howard Bloom - HTR
1964.usmc@att.net or 702 368-0568

Ojai Valley Gun Club
www.dock.net/ovgc

Call: Barry Bluhm 805 798-2473
TwiLiteZ585@hotmail.com

Palomino Valley Gun Club
palominovalleygunclub.homestead.com
GPS: N39 51.374 W119 40.046
Call: Robert Hoppe - Long Range
RobH@saturnnet.com
775 827-8679 or 775 397-3358

Call: Steve Archibald - Varmint
775 742-1153 nevadaswa@aol.com

Sahuaro 1000-Yard Benchrest
www.tucsonrifleclub.org
Call: Karl Hunstiger 602 971-4400
2901 E Cortez St, Phoenix AZ 85028
wfo13@aol.com

Sloughhouse Benchrest Shooters
www.sacvalley.org

Call: Craig St Claire - Long Range
galtshtr@gmx.com 209 744-2274

Call: Dan Lutke - Short Range
408 241-9759 lutke5@sbcglobal.net

Tehama Shooters Association
www.tehamashooters.com
Call: Richard Heinsohn 530 339-1287
voyager658@yahoo.com

Visalia Sportsman Association
www.visaliasportsmans.com
Call: Dennis Thornbury 559 432-4401
559 280-6243 gunhandler@gmail.com

ROGUE VALLEY - 600-YARD

02/19/2017

Lite Gun Score

Sandra Sheehan	143-1x
Charlie Costner.....	141-2x
Regina Hoffman.....	139-3x
Kaitlin Sulfridge.....	136-0x
Chris Sheehan.....	134-1x
Richard Sulfridge.....	125-0x
Bruce Bangeman.....	122-0x
Sarah Jump.....	109-0x
David Wilson.....	94-0x



03/19/2017

Lite Gun Score

Charlie Costner	145-4x
Keith Faller.....	144-4x
Regina Hoffman.....	144-2x
Sandra Sheehan.....	143-3x
Richard Sulfridge.....	140-0x
Bob Dorton.....	139-2x
Canada Cummins.....	135-2x
Larry Kahle.....	127-1x
Chris Sheehan.....	126-0x
Kaitlin Sulfridge.....	124-1x



Washington State

06/11/2017

Lite Gun Score

George Mac Donald	146-4x
Robert Hoppe.....	145-3x
Keith Faller.....	139-5x
Bill Johnston.....	138-1x
Charlie Costner.....	137-2x
Larry Kahle.....	131-0x
Sarah Jump.....	125-2x



QUOTE of The MONTH

**There are
only two
options:
Make
progress
or make
excuses.**

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MARCH MADNESS - SAHUARO 1000 YD

The March match started out with a pleasant 39 degrees in the southern Arizona desert, warming to a perfect 80 degrees by noon. Spring had arrived. That funny wind was playing its usual tricks, whistling through the ocotillo and saguaro cactuses, coming and going, changing direction unexpectedly. Like a confused squirrel that's had too many energy drinks.

It was one of those days where the relay one guys had a tough time, while later in the day conditions got a bit better. Of course, when we are talking about the 1,000 yard Three Points range, 30 miles west of Tucson, "Better" is a very subjective term.

We had a good turn out of regular shooters and some new talent, who are always welcome to come and try their hand at this game. Match Director Karl Hunstiger had us up and running, pulling triggers by 8:00 AM. The relay one guys did okay, but in light gun, it was the relay three guys who shined. When it was all over, the top five shooters in light gun had sub-MOA aggregates, and there was a bunch of sub-MOA groups. 15 all together. Ross Herrick led the way, as usual, shooting the smallest group of 4.87", but it was Bill Warner turned in the best aggregate with a 6.08" average of 15 shots. Winning for group aggregate.

Bill also put in the best total score, with a 138-1X, and he tied with Lon Persun for high target, both of them posting a 49-1X. Lon did some great shooting considering he had to deal with those squirrely relay one winds.

Heavy gun results were interesting, we actually had 12 sub-MOA 10 shot groups for the day, with Dale Aronson getting the smallest group of 6.12" and the best 30 shot aggregate of 7.39". Bill Warner was right behind him with a 10.00", just edging ahead of Ross Herrick's third place 10.16".

In heavy score, Lon Persun shot three high scoring targets, including a very nice 93-2X, but high single target score went to Dale again with a 96-1X. The total score trophy went to Dale also with his 269-3X.

That wrapped it up for another fun monthly match, by 12:30 we had everything put away and were off to our new super secret, hidden restaurant to hang out and have hot juicy burgers, cold drinks and good conversation.

If I told you where it was I'd have to... well.... Never mind. But if you'd like to know, you can come join us next month and see for yourself.

Dale Aronson

Lite Gun Aggregate

Bill Warner.....	5.32"
Mike Billotte.....	7.65"
Ross Herrick.....	8.63"
Lon Persun.....	8.73"
Dale Aronson.....	9.63"
Steve Brown.....	10.60"
Ed Schwenn.....	11.33"
Jerry Riesdorff.....	44.69"

Small Group - Ross Herrick.....4.875"



Heavy Gun Aggregate

Dale Aronson.....	7.40"
Bill Warner.....	10.00"
Ross Herrick.....	10.17"
Mike Billotte.....	10.29"
Lon Persun.....	11.17"
Jerry Riesdorff.....	12.56"
Brad Stepan.....	13.58"
Ed Schwenn.....	29.54"

Small Group - Dale Aronson.....6.125"

Lite Gun Total Score

Bill Warner.....	139-1x
Dale Aronson.....	139-0x
Lon Persun.....	137-1x
Mike Billotte.....	136-0x
Ross Herrick.....	130-0x
Ed Schwenn.....	128-0x
Steve Brown.....	121-0x
Jerry Riesdorff.....	114-0x

High Score - Bill & Lon.....49-1x



Heavy Gun Total Score

Dale Aronson.....	269-3x
Lon Persun.....	267-2x
Jerry Riesdorff.....	247-0x
Brad Stepan.....	234-1x
Ed Schwenn.....	230-2x
Mike Billotte.....	230-0x
Ross Herrick.....	222-0x
Bill Warner.....	220-0x

High Score - Dale Aronson.....96-1x

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