Fred.

Phil Koehne will be in sometime next week. Do you want to attend a meeting with him?

Ronay

SHOOTER'S IN-SIGHT

By Ross Seyfried

A world champ takes a sharp look at today's gun scene.

■ Recently, several of your letters have made me aware of a problem that confronts you when you want to buy a product that you have seen in my column. Sometimes I will quote a retail price on a product so that you have some ball park idea of what that item costs, and later, when you order that product, you find the price is considerably higher than you expected. There are two reasons why this happens. First, you should understand that there is a considerable time lag between my purchasing and evaluating the product, and when you see it printed in *Guns & Ammo*. From the date that I submit material to the magazine, to the day you read it, takes a minimum of three months. Normally I will own and use a given product for several weeks or months before I am confident that it has the quality and performance to make it worthy of me telling you about it. In short, from the time I buy a product for testing until you read about it could easily be six months or a year. In that time, very natural price increases can and do occur. There are also times when a manufacturer, especially a small independent one, will sense the tremendous advertisement value of my putting my seal of approval on his product. In the American way of supply and demand they will raise their price, sort of charging what the traffic will bear. Good, bad or indifferent, this is the way of

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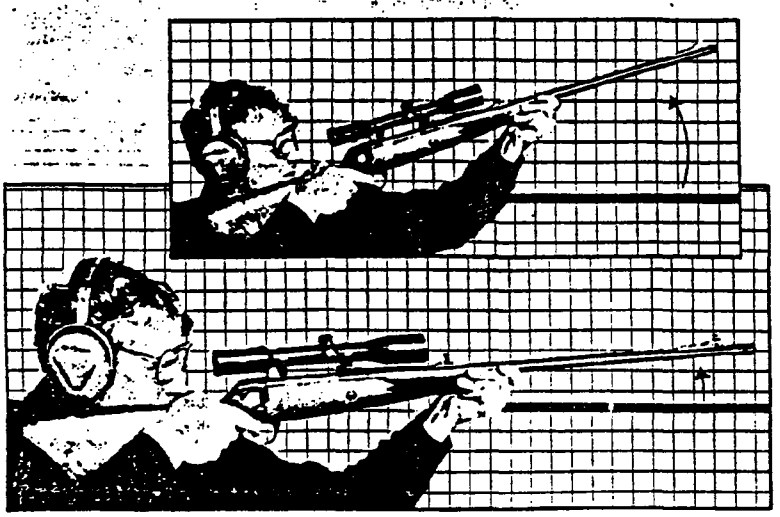

In top photo, author fires the powerful new .411 KDF cartridge without using any recoil reducing device. Bottom photo shows how the muzzle jump is held down when the KDF muzzle brake is employed.

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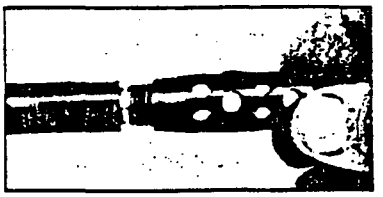
the American marketplace, but keep in mind *you* are in charge of that system. If someone gets too greedy and charges more than you think a product is worth . . . don't buy it. If enough people agree with you, the price will come down. It's simply called *freedom*, the same thing that lets us own firearms and shoot!

Those of you who know me and even some who don't will be surprised to see me devoting space to a muzzle brake. It's not that I'm biased against them, I just don't like the damn things. Or, I should say, I didn't like them.

My dislike was well-founded, since in general they were obtrusive, ugly, noisy and more or less didn't work. When I was competing, I had access to any kind of brake or compensator for the .45 ACP I wanted. I didn't use any of them, because the very minimal benefits were outweighed by their negative aspects. I just left it at that for rifles or handguns. My attitude was, "Show me one that works, and I'll take the time to look again." Some months ago a friend called to say that he had seen a rifle with a muzzle brake on it that was something special, and it really worked.

I doubted that, but contacted KDF and had a brake fitted to my .30-06, then had them send me a loaner rifle chambered for their proprietary .411 KDF cartridge. I'll talk about the .411 in depth later, but to keep things in perspective, it is a ballistic brother to my pet .416 Rigby. They live in



To adapt a KDF muzzle brake to your rifle, the barrel must be threaded. Then simply screw the brake in place.

the realm of major horsepower for heavy game—400-grain bullets at 2,400 feet per second (fps). That kind of power also has an attendant heavy recoil, making the .411 a good guinea pig to acid test the KDF muzzle brake.

My lack of success with brakes in the past aside, physics lessons were the main reason I doubted if the KDF brake would work. This fellow Newton, who said there was an equal but opposite reaction for every action, hasn't been proven wrong yet. What he was saying about guns is that if you push a lot of energy downrange toward the target, your gun is going to push back uprange (recoil). The point being that there isn't a damn thing you can do about recoil, except make the gun heavier and make the recoil velocity of the gun lower to make it feel better. Unfortunately, the

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cure becomes worse than the disease if the arm is heavier than we want it. What I hadn't considered is that the recoil that you can't cure is only related to the bullet's mass and its velocity. There is another component of recoil that I hadn't thought about. *This is the recoil generated by the gas escaping the muzzle.* A firearm, in very simple terms, is nothing but a rocket engine (with a bullet or shot charge in front of it). The gas generated by the burning powder pushes the bullet or shot down the barrel and toward the target. As the lead leaves the muzzle, all of that compressed gas escapes and drives the gun back toward you, just like a rocket. If you don't think there is some real force there, just have a look at a rocket, and imagine that its booster tanks are full of gunpowder, rather than rocket fuel. Just watch that big bird scream into orbit. The booster engines make hot, high-velocity gas that is directed through nozzles toward the ground. They generate millions of pounds of thrust towards the earth and push that rocket the other way. A firearm does the same thing on a miniature scale. Gas downrange, gun back at shooter, equals part of the firearm's recoil.

What we need to do to get rid of this "gas recoil" is to direct the forces of the gas in some direction other than directly away from the shooter. The KDF brake does just that by directing the gas in a full circle around the barrel, at 90 degrees to the bore. The gas pushes up, down, left and right, making the net effect of all of this *nothing*. That is, the gas ends up working against itself, not pushing the rifle in any direction and to a great degree eliminating the "rocket engine" part of the recoil.

The physical machinery that does the job is actually quite simple. The rifle's muzzle is threaded and a 2-inch-long tube is screwed onto the threads. It makes your rifle 1½ inches longer and 1½ ounces heavier, with the brake itself being .750 inch in diameter. This makes a small "bulge look" on my standard Remington .30-06 with a barrel diameter of .660 inch at the muzzle. (These dimensions are on the .30-06 and vary with the caliber.) The brake has 24 holes drilled in it—four rings of holes around the brake with six holes in each ring. The "bore" of the .30 caliber brake is .330 inch in diameter, just large enough to clear the .308-inch bullets without touching the brake.

What happens in actual firing is that the bullet exits the original muzzle and crown on your rifle just like it always did, with the high-pressure gas pushing it. The bullet almost plugs the bore of the brake, forcing the gas out of the circles of holes behind the bullet. By the time the bullet leaves the brake itself, almost all of the gas has dissipated in circles around the muzzle, and there isn't very much left to push the rifle back your way.

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Because the brake doesn't ever touch the bullet, and doesn't redirect the gas until the bullet has left the original muzzle, the accuracy and ballistics of the original rifle are not affected. Your velocity and group size don't change measurably. What does change is the noise and recoil perceived by the shooter. You get a lot more noise and a lot less recoil.

The noise is probably the only real negative factor about the KDF brake. Firing a rifle with the brake is a lot like firing a magnum revolver—you get surrounded by a lot of noise and muzzle blast. Ear protection of some kind is almost going to be a "must," and you will have to be doubly aware of bystanders when you fire.

The real reason for this whole drill is to get rid of some recoil, and the KDF brake does an almost magical job of that. Actual felt recoil of the .30-06 comes down to the level of a .243 round. Shooting the .411 is another pleasant story. Rifles in this power range are not fun to shoot from the benchrest. With the brake on the .411 rifle I could almost forget I was bench testing a heavy. Its recoil level drops to something like the .300 magnum's—a major decrease. In fact, after firing over 20 rounds with the brake on the rifle from my bench, I took the brake off just to see if I was imagining the lower recoil. I wasn't! The brake had lulled me into firing the big gun with a very light hold. The first round without it literally shocked me right back into reality by kicking the hell out of me. The motor drive photos clearly show the reduction in both rearward recoil and muzzle rise with the brake on the rifle.

As you see, my tests were done with the same rifles by removing and replacing the brakes. They are designed to be screwed on and off by hand. If you want to use the rifle without the brake, a small, knurled thread protector is screwed on the barrel to protect the threads. Unfortunately, in most cases you will get a major change in point of impact between groups with the brake on and off. My .30-06 almost didn't know if the brake was on or off, as groups moved only about 1½ inches with the change. But the .411 shot a foot low with 400-grain bullets at 100 yards when I shot it without the brake after zeroing it with the brake on. Remember, this isn't a velocity change. The groups move because of changes in the barrel vibration pattern and other complexities that maybe only the gods who control rifled bores understand. Each cartridge, brake and barrel may be different. Just don't count on being able to screw the brake on and off and have the rifle shoot to the same point of impact.

The degree of recoil reduction will depend on the weight of the rifle and the cartridge. If you have a lightweight rifle chambered for one of the .300 or 7mm magnums, the recoil reduction will be monumental. The recoil of a .458 Winchester will be reduced by a lesser percentage. This is because a lot higher percentage of the .458's recoil is caused by its bullet weight and less by its gas. Gas is a very major component of the small-bore magnum's recoil as compared to its relatively light bullet. Just keep in mind it's only the "gas-rocket" recoil we can do anything about.

The KDF brake isn't a cure for all shooters and all situations, but it opens a lot of options. I think its most important contribution is that it will allow many shooters to comfortably and accurately shoot rifles of considerably more horsepower. For instance, the .30 caliber magnums with 200-grain bullets will feel comfortable to people who used to stop at the .270's recoil level. In the big-game fields, shooters accustomed to the recoil of the .30 magnums will be right at home with the .375, .411 or .416 cartridge. Simply, many shooters are going to be able to apply more horsepower with the same precision. The lower recoil levels will also lend themselves to lighter rifles with the same power. The brakes aren't for everyone, but if you want less recoil, or more power, or a lighter rifle at the recoil levels of lesser guns, have a look at the KDF system. We might stop some wear and tear on shooters, and most important, by hunting with more powerful rifles that are fired with the same accuracy, we should reduce the number of our great game animals lost to crippling each year. If I can save even one lost deer, elk, bear, or Cape buffalo, this space has been well worth it.

.411 KDF CARTRIDGE

You have noted that I mentioned the .411 KDF cartridge during my testing of the KDF muzzle brake. It is a proprietary cartridge manufactured by the KDF firm. This is interesting, almost like the good old days when arms companies were interested enough in what they were doing do have their very own cartridges. It conjures up memories of things like the .465 Holland and Holland or the .416 Rigby—cartridges that serve exactly the same purpose as others on the market, but with the pride of the manufacturer's name on them. That is exactly what the .411 KDF does. It fills the ballistic space occupied by the .416 Rigby and its modern version, the .416 Taylor.

In the broadest sense they are .40 caliber bullets weighing 400 grains, with muzzle velocities of 2,400 fps. The .416 Rigby is the grandfather of the family. It came from the grand "Nitro Express" era of the big cases loaded with cordite and low chamber pressures. The drawback is that to use the .416 Rigby you needed a big action. It was and is a fantastic cartridge, but American wisdom had produced its ballistic equivalent in a much smaller package. The one I am the most familiar with is the .416 Taylor. It is made by necking down the .458 Winchester to take .416-inch-diameter bullets. (It also can be made from necked up .338 Winchester cases, but the reduced .458 is most practical.) The results are delightful, with the .416 Rigby's horsepower

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made adaptable to standard-length, standard-size actions.

The .411 KDF follows the same trend and is almost an identical cartridge to the .416 Taylor, but it uses .411-inch-diameter bullets. Its bore is the same as the old .450/400 Nitro Express designed for double rifles and can utilize the same bullets. I'm sure you're wondering where you're going to find .411 bullets. It just happens that the .411 KDF was designed with the help of a bullet company. Randy Brooks of Barnes bullets did a lot of the engineering on the .411 KDF. Needless to say, they will supply bullets in a wide variety.

Starting with 300-grain spitzer bullets, the .411 is actually versatile enough to cover a wide range of needs. The 300-grain bullet runs easily at 2,800 fps from a 26-inch barrel. With this load you have serious horsepower and trajectories similar to or better than the .30-06 round. With the 300-grain loadings it becomes a super long-range deer or elk rifle and would be perfect for blowing the spots off a leopard. Moving up the scale to 400-grain bullets, the .411 becomes what it was designed to be—a "heavy." It becomes perfect for timber elk, bear and all of the rest of the world's big game. It is a grand buffalo cartridge and takes the fight out of lions better than any other round I have seen. I make these statements generically about 400-grain, .40 caliber bullets with 2,400 fps muzzle velocities. They just haven't made the Cape buffalo or lion who can read headstamps and tell the difference between Rigby, Taylor or KDF. The same applies to the .005-inch difference in bullet diameter between the .416 and the .411 KDF. Show me a buffalo who can tell the difference, and I'll give you my rifle. So even though I haven't used the .411 on game, I know how it will work.

The bullets are made with two jacket thicknesses, .032 inch and .049 inch. Other than for leopard I can't see a use for the thin jacket, but if you want it, they are available. Barnes also makes the spectacular "super solids" for the .411 KDF. These are quite simply the best solid bullets I have used. Driven out of the .411, they should shoot through Cape buffalo from almost any angle. With my .416 Rigby, I shot buff from side to side and end to end and wasn't able to stop a bullet to bring home. They are made from homogenous brass or bronze and just don't deform in any way.

Combine the fine bullet selection, the .411 cartridge and the KDF muzzle brake and you have a winner. It's true big-bore, heavy-duty "Nitro Express" performance in a modern, manageable package. If you're considering big-game hunting, or taking elk under tough conditions, this one is certainly worth your time to investigate. For details, write to KDF International, 2485 HWY 46 N., Dept. GA, Seguin, TX 78155.

WHAT'S NEW FROM REMINGTON FOR 1986

This latest line-up of goodies shows a total commitment to the shooting sports.

By Bob Milek

Remington's Dick Dietz found the XP-100 .223 "Varmint Special" ideal for zapping long-range prairie dogs.

Author Milek took to the .223 XP-100 like a duck to water, managing 1½-in., 100-yard groups with factory fodder.

■ At their new products seminar held at Robert Roger's La Media Lodge near McAllen, Texas, in November, 1985, the Remington Arms Company previewed the largest line of new products that this writer has seen from the company in recent years. New products, the reappearance of some old favorites, new factory ammunition loadings—they all add up to an impressive list indeed.

More importantly, they should squelch rumors that the parent company, du Pont, was ready to dump Remington. The product line for 1986, plus a sizeable investment to update the Ilion, New York, plant, add up to one whale of a commitment by Remington to the American shooting sports.

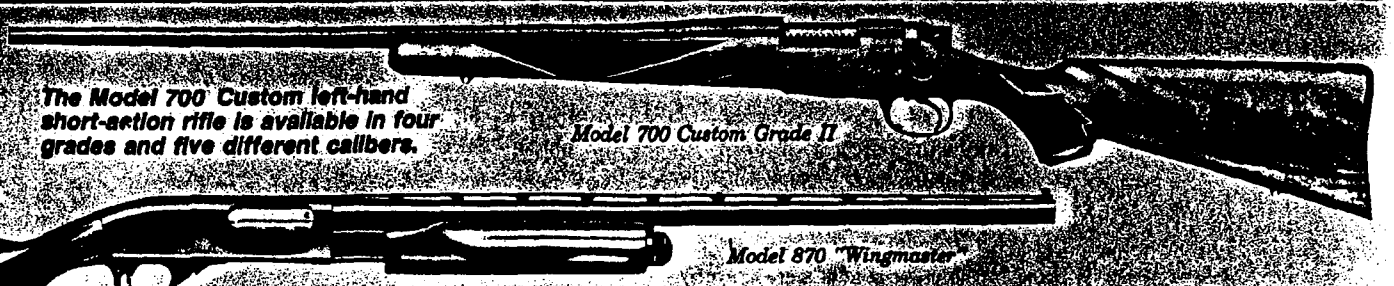
To detail all of the new products would require far more space than is available here. Therefore, I'll touch lightly on everything, and you readers can run down to your local Remington dealer and get a first-hand look at the new goodies.

Two items head the list. Being a dedicated handgun hunter, I'll have to admit that most exciting for me is the introduction of the XP-100 Varmint Special in .223 Remington chambering. I've been campaigning for over three years for this pistol. Featuring a 14½-inch barrel in the familiar du Pont "Zytel" stock, the Varmint Special XP-100 comes without sights, a wise move since the pistol's primary purpose is long-range varmint hunting and precision benchrest shooting. The receiver is drilled and tapped for both a scope mount and a receiver sight.

The .223 Remington cartridge is a natural for this strong bolt-action pistol, and with its introduction in the XP-100, the shooter now has a pistol chambered for a popular commercial cartridge that works great in the field. If you don't handload, you'll get good performance from factory ammo. However, handloaders will find that they can crowd 3,000 feet per second (fps) out of the .223 using a 50-grain bullet in the 14½-inch barrel. With factory ammo you can expect 100-yard groups of 1 to 1½ inches, and using properly prepared handloads, sub-minute-of-angle groups are the rule rather than the exception. The .223 is going to breathe new life into the XP-100, and the pistol is destined to become a staple item in the Remington line.

If you don't think that the XP-100 Varmint Special is an important addition by Remington to the sport of handgun hunting, then the next item should remove all doubts. Through the Remington Custom Shop you can now get an XP-100 in either 7mm-08 or .35 Remington chambering. These custom jobs sport beautifully designed stocks of high-grade American walnut. When these two custom calibers are added to the production .223 and the 7mm Bench Rest Remington, you have XP-100 pistols that will handle everything from varmints through elk-sized big game.

Riflemen will find the new Model 700 Mountain Rifle just as exciting as I find the XP-100 pistol. Representing the ultimate refinement of the famous Model 700, the Mountain Rifle features a lightweight 22-inch barrel set in a superb classic-style stock of American walnut with a cheekpiece on the left side. Twenty-lines-per-



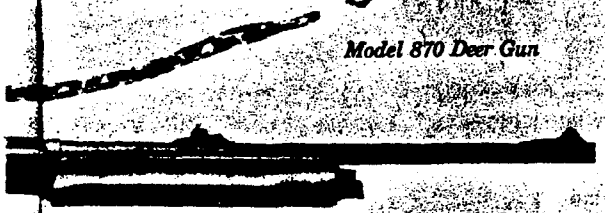
The Model 700 Custom left-hand short-action rifle is available in four grades and five different calibers.

Model 700 Custom Grade II

Model 870 "Wingmaster"

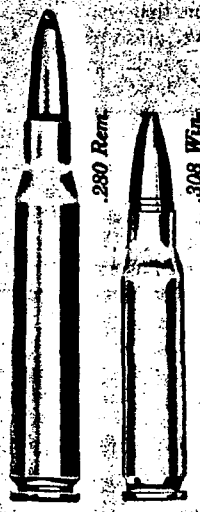
The classic 870 has been restyled with new stock featuring cut checkering and low-gloss finish.

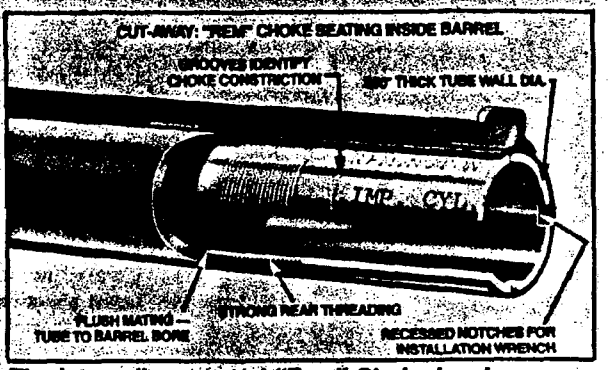
Model 870 Deer Gun



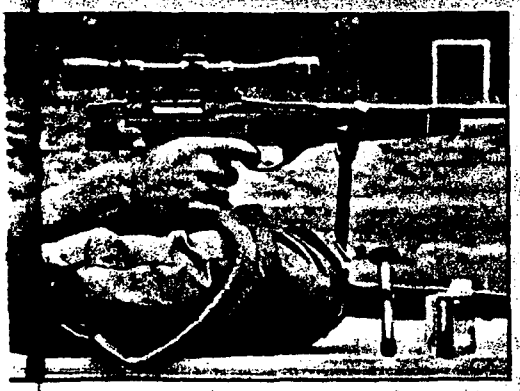
Model 1100 Deer Gun

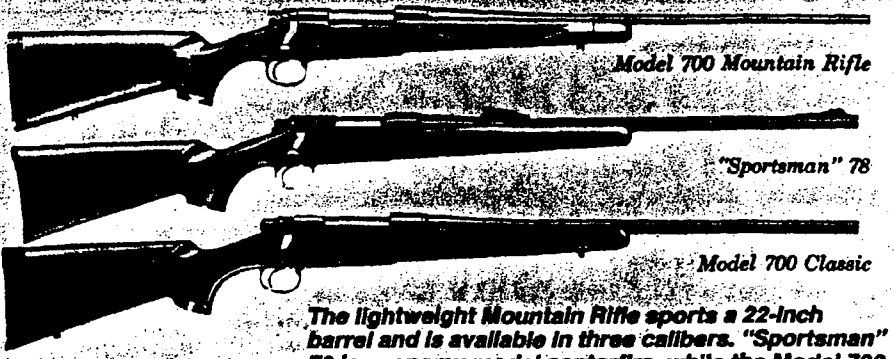
Remington offers its new 12 gauge Deer Guns in either the popular 870 pump gun or the autoloading 1100.





The internally mounted "Rem" Choke has been redesigned so that choke and barrel give a combined thickness of only .074 inch. The tubes fit flush with muzzle and are installed with a special wrench. Two new factory rifle loadings (left) of a 140-grain .280 Rem. and 165-grain .308 are offered.





Model 700 Mountain Rifle

"Sportsman" 78

Model 700 Classic

The lightweight Mountain Rifle sports a 22-inch barrel and is available in three calibers. "Sportsman" 78 is economy model centerfire, while the Model 700 Classic offers smooth lines, custom features.

inch checkering decorates the pistol grip and fore-end. The stock has a black fore-end tip, a black rubber recoil pad, sling swivel studs and an attractive and functional matte finish. Furnished without open sights, the Model 700 Mountain Rifle will initially be offered in .270 Winchester, .280 Remington and .30-06 chamberings. Sans sights it weighs in at 6¾ pounds.

To complement the production Mountain Rifle, a custom-made Model 700 with a du Pont Kevlar stock will be available in 1986 through Remington's Custom Shop. Dubbed the Model 700 "KS" Mountain Rifle, this custom piece will be available in both right and left-hand actions in .270 Winchester, .280 Remington, .30-06, 7mm Remington Magnum, .300 Winchester Magnum and .375 H&H Magnum. The "KS" features a blind magazine, black rubber recoil pad, sling swivels and a 24-inch barrel. Its weight runs just 6 lbs., 6 oz. without sights.

While we're on the subject of that Remington Custom Shop, I guess now is the time to mention three more new offerings available from it in 1986. The first is a Safari Grade Model 700 chambered for the 8mm Remington Magnum cartridge. This one has a magnum-weight barrel; the classic-style stock and iron sights are optional. Expanding the custom line even further, Remington will now offer Model 700 rifles in left-hand short actions in .22-250, .243 Winchester, 6mm Remington, 7mm-08 and .308 chamberings. The last item from the Custom Shop will be great news for the rimfire enthusiast. Beginning this year, you can get one of the most accurate .22 sporters ever made—the 40-XR Rimfire Sporter. This rifle was always a Custom Shop item, but it was discontinued in 1978. Now it's back, in grades I through IV, so you discriminating rimfire fans no longer have to bemoan the fact that you can't get a 40-XB Sporter.

Remington's also back in the production bolt-action rimfire business after having dropped the entire line a year ago. For 1986 they offer two rifles, the Model 541-T and the 581-S. Both have the familiar six locking lugs that cam into the rear of the receiver, not the front. The 541-T is the new version of one of my all-time favorites, the Model 541-S. The new rifle is changed from the old only in that there's a black fore-end tip on the American walnut stock, and the not-so-attractive scroll engraving on the receiver has been dropped. In other

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NEW FROM REMINGTON

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The Model 581-S is the newest member of the economy Sportsman line. It features a hardwood stock and a 24-inch barrel topped with iron sights. The receiver is grooved for a clamp-on scope mount.

Finally, in the rifle line, Remington is again making available a limited-run Model 700 Classic, this year in 264 Winchester Magnum chambering. This is the sixth in the limited-edition Classic series and will be available about midyear.

Oh, yes, lest I forget, the .223 Remington cartridge has been added to the list of chamberings for the Remington Model 78 Sportsman bolt-action rifle. It will have a 24-inch barrel, open sights, and the receiver will be factory drilled and tapped for a scope mount.

The big news for you shotgunners is the "Rem" Choke, Remington's version of the interchangeable internal choke tubes that have become so popular. Available only in 12 gauge guns, Remington redesigned their barrels so that with this choke system you wind up with a combined barrel/choke tube thickness of .074 inch. The tubes fit flush with the muzzle of the barrel, and a special wrench is required to install them.

The Model 700 Custom KS Mountain Rifle has lightweight Kevlar fiber synthetic stock.

This custom XP-100 is a .35 Rem. with an English walnut stock, topped by a Simmons 4X. Also new is .223 XP-100.

For 1986 the "Rem" Choke system will be available in Model 1100 and 870 standard guns with 26 and 28-inch barrels, restyled Model 870 Wingmaster guns with 26 and 28-inch barrels, Model 1100 and 870 Special Field shotguns with 21-inch barrels, Model 1100 and 870 SP Magnum shotguns with 26-inch barrels and Sportsmen 12 gauge auto and pump shotguns with 28-inch barrels.

In the last paragraph you probably noticed mention of the restyled 870 Wingmaster. For 1986 the 12 gauge Wingmaster will have a new stock featuring cut checkering, a low-gloss finish and a brown recoil pad. Three-inch chambers are standard. Barrels of 26 and 28 inches will have the "Rem" Chokes, while the 30-inch barrel will be available in full choke only. All barrels come with a ventilated rib featuring an ivory Bradley bead up front and a mid-barrel bead.

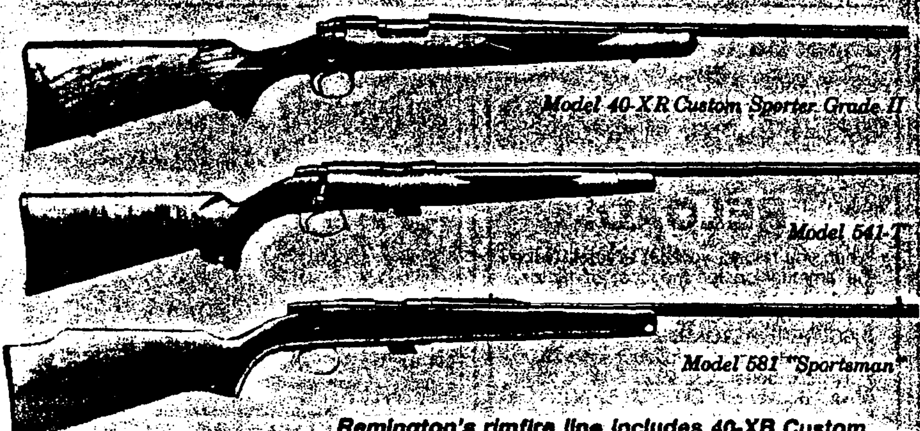
Remington's Model 1100 and 870 deer guns will have a new look for 1986. Called the SP Deer Guns, they'll wear the Parkerized non-glare metal finish and come with quick-detachable swivels and wide, padded du Pont Cordura camouflaged slings. These guns will also have an inclined ramp rear sight adjustable for windage and elevation, a white bead front sight and a black recoil pad.

In the ammunition line we'll see four new factory loadings from Remington—two for rifles, two for handguns. A most interesting rifle load is a 140-grain bullet for the .280 Remington—flat-shooting ammo that's a superb choice for hunting deer-sized game at long range with the .280 chambering. Loaded to a muzzle velocity of 3,000 fps, the 140-grain bullet is still moving at 2,102 fps out there at 400 yards. Several animals were taken with this new load at the seminar, and it worked well on medium-sized game. It should not be considered for elk, moose or dangerous bears.

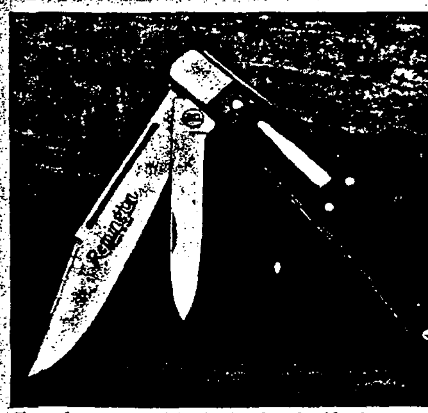
By popular demand, a 165-grain pointed soft point Core-Lokt bullet load for the .308 Winchester is now available from Remington. This one should be an excellent choice for most of the hunting for which the .308 cartridge is suitable. Of course, the Core-Lokt bullet's performance is legendary, so you know what to expect in the way of expansion.

There are two new pistol loadings from Remington—a 158-grain +P semi-wadcutter for the .38 Special and a 200-grain semi-wadcutter for the .44 Special. I don't know what the demand is for another +P load for the .38, but there's certainly room for a good .44 Special. I'll have some performance information on this ammo a little later on in the year.

I'll close out this dissertation on Remington's offerings for 1986 with a tidbit for you knife collectors. The sixth in the limited-edition Bullet Knife series is the Hunter, a two-bladed dandy. One blade is a Turkish clip that's 4⅛ inches long, while the other is a 2⅜-inch pen blade. The handles are of Delrin with a nickel silver cartridge shield on one side, and the blades are made of 440 stainless steel. ■



Remington's rimfire line includes 40-XB Custom Sporter in four grades, the 541-T and 581. Both the 541-T and 581 have six rear-camming locking lugs.



Remington's sixth Bullet knife is a twin-bladed folder. Handles are of Delrin; blades are stainless steel.

HANDGUNS FOR QUARTER-MILE VARMINTING

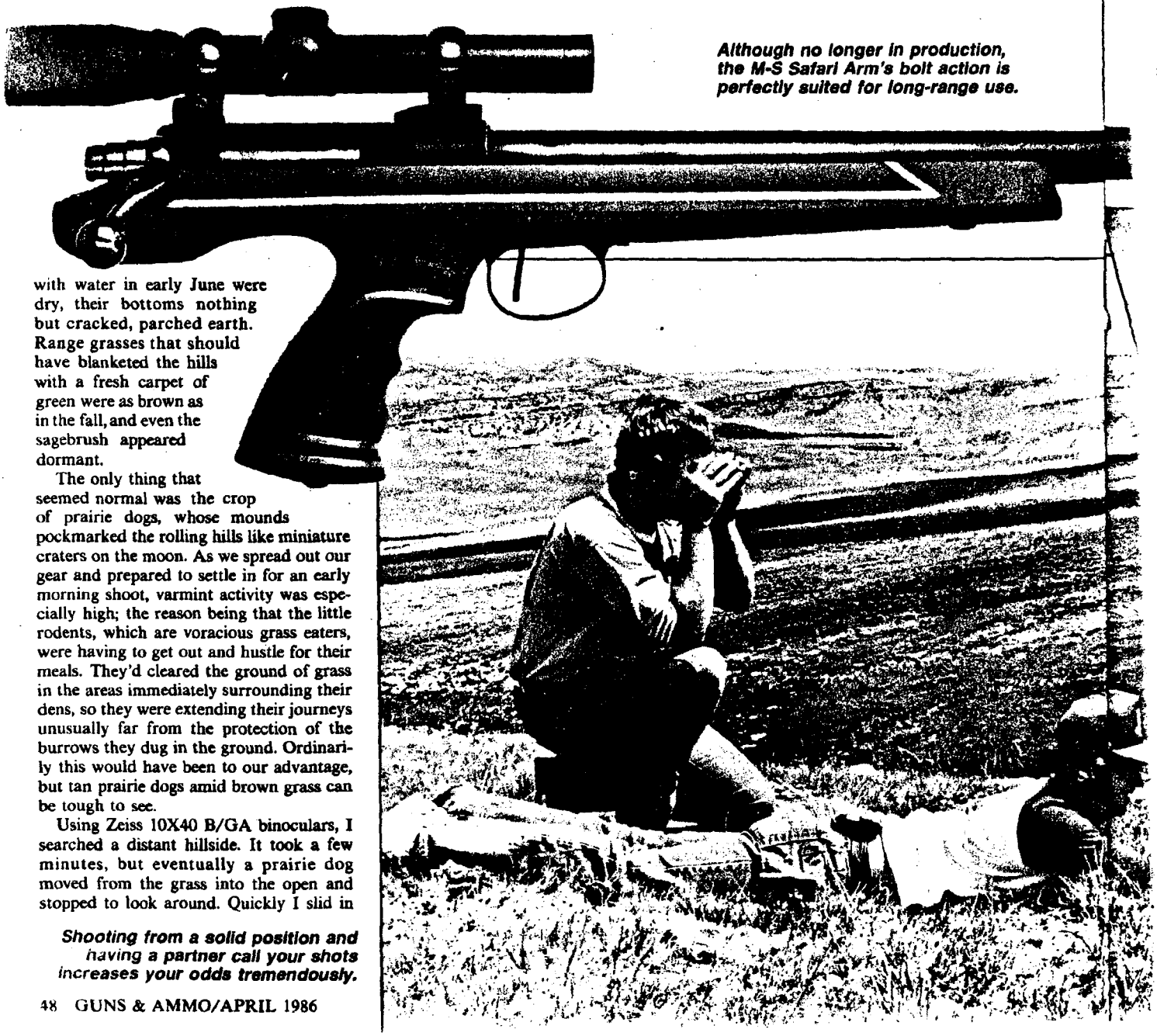
Picking the right combination of gun and cartridge requires an understanding of what's involved.

By Bob Milek

■ It had been a very dry spring. Almost no rain had fallen, even in the mountains. This, coupled with a serious shortage of snow for spring runoff, had created on the plains and badlands of Wyoming's Big Horn Basin a condition of drought as serious as I'd seen in my 50 years in the area. Stock reservoirs that were normally filled with water in early June were dry, their bottoms nothing but cracked, parched earth. Range grasses that should have blanketed the hills with a fresh carpet of green were as brown as in the fall, and even the sagebrush appeared dormant.

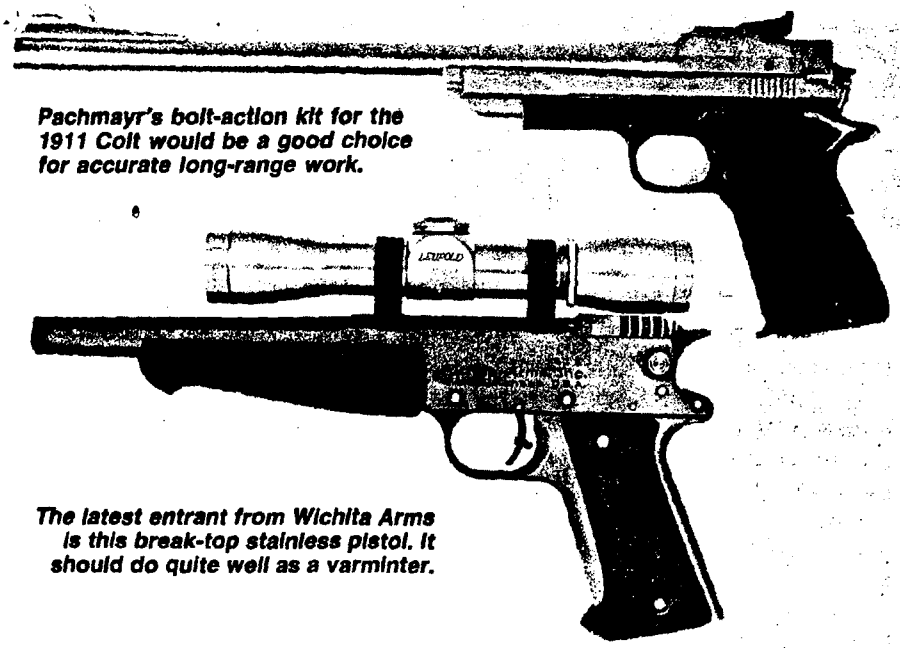
The only thing that seemed normal was the crop of prairie dogs, whose mounds pockmarked the rolling hills like miniature craters on the moon. As we spread out our gear and prepared to settle in for an early morning shoot, varmint activity was especially high; the reason being that the little rodents, which are voracious grass eaters, were having to get out and hustle for their meals. They'd cleared the ground of grass in the areas immediately surrounding their dens, so they were extending their journeys unusually far from the protection of the burrows they dug in the ground. Ordinarily this would have been to our advantage, but tan prairie dogs amid brown grass can be tough to see.

Using Zeiss 10X40 B/GA binoculars, I searched a distant hillside. It took a few minutes, but eventually a prairie dog moved from the grass into the open and stopped to look around. Quickly I slid in



Although no longer in production, the M-S Safari Arm's bolt action is perfectly suited for long-range use.

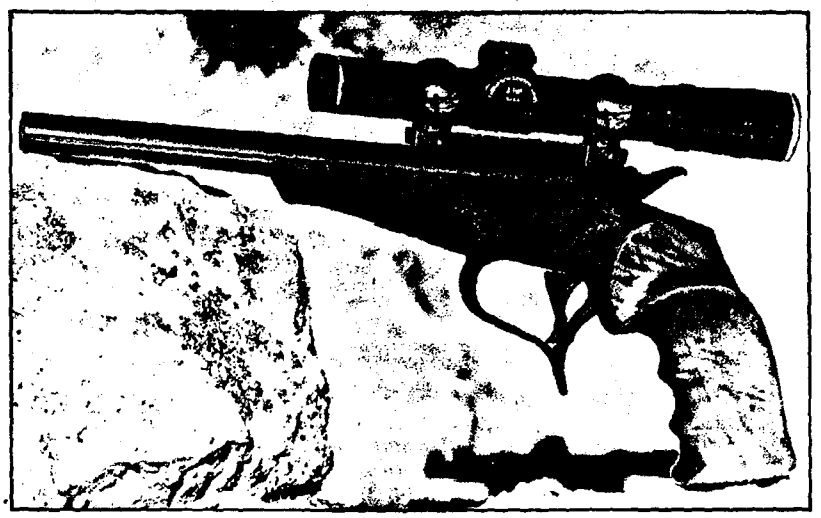
Shooting from a solid position and having a partner call your shots increases your odds tremendously.



Pachmayr's bolt-action kit for the 1911 Colt would be a good choice for accurate long-range work.

The latest entrant from Wichita Arms is this break-top stainless pistol. It should do quite well as a varminter.

Combining the author's custom XP-100 with the Burris 10X scope resulted in a tack-driving pistol.



This Thompson/Center combo of the Contender pistol with T/C's 3 RP scope is a tough combination to beat. Available in a wide variety of calibers suitable for varminting, the Contender is a top choice.

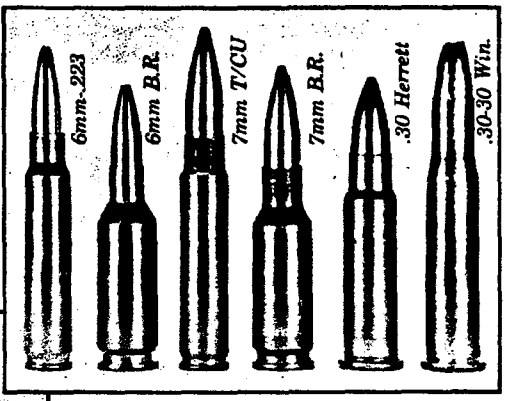
Prairie dogs are extremely difficult targets to connect with at distances beyond 200 yards. Full grown, they stand only 12 inches tall and present a "vitals" area that is a mere 3 to 4 inches wide.

behind the custom XP-100 Remington in 6mm-.223, closed the bolt on a fresh handload and located the varmint in the field of the Burris 7X pistol scope. The range was close to 200 yards, exactly the distance at which the pistol was sighted, so I quartered the prairie dog's chest with the cross-hair and squeezed the trigger. From behind me, Mike Bussard of Norma let out a whoop. "Did you see that? The varmint exploded when that bullet hit him!"

I hadn't seen it—I lost the dog in the field of view when the pistol recoiled. However, I knew what he meant—I'd watched a good many other hunters poke prairie dogs with pistols chambered for the .223 Remington, 6mm-.223, 7mm T/CU, 7mm B.R. and numerous other cartridges. When the right bullet is used, the effect is as if the prairie dog swallowed a cherry bomb. From the XP-100 6mm-.223, I push a 60-grain Sierra hollow point bullet out the muzzle at 2,971 feet per second (fps). At 200 yards it's still moving at 2,180 fps, and it comes apart on contact with the hide of a prairie dog.

Bullet performance—that's one of the secrets to successful long-range varmint shooting with handguns. First, though, you've got to pick a handgun and cartridge

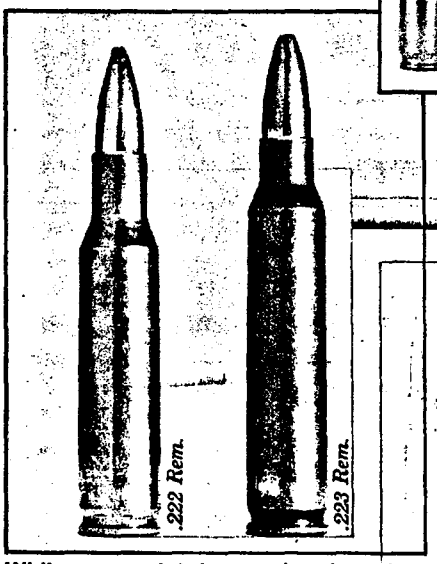
A shooting position like the one depicted is okay for occasional quick shots at closer distances, but if at all possible a steady position would be more preferable.



All six of these cartridges can be used for varminting, though the .30 calibers are limited in use due to the bullets available.

HANDGUN VARMINTING

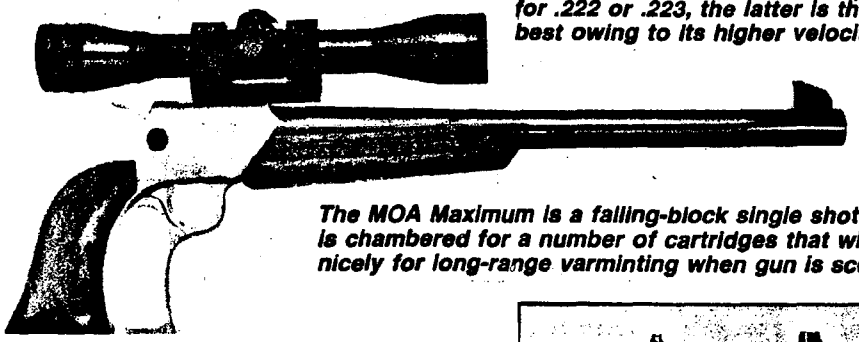
that's capable of doing the job. To do this, it's important to understand just what's involved in long-range varmint shooting. By long range I mean anything over 100 yards, and with certain cartridges for which handguns are chambered, 300 to 350 yards isn't too much to ask. Your targets can vary in size from ground squirrels to coyotes, but by far the most shooting will be done at prairie dog and chuck-size targets. When sitting erect, as is their habit, a full-grown prairie dog presents a target



While many pistols are chambered for .222 or .223, the latter is the best owing to its higher velocity.

LONG-RANGE VARMINT-HUNTING CARTRIDGES

CARTRIDGE	BULLET WEIGHTS (GRAINS)
.222 Remington	45, 50
.223 Remington	45, 50, 52, 55
6mm-.223	60, 70, 75
6mm B.R. Remington	60, 70, 75
6mm T/CU	60, 70, 75
6.5mm T/CU	85, 87
6.5mm JDJ	85, 87, 100
7mm T/CU	100, 115, 120
7mm JDJ	100, 115, 120
7mm B.R. Remington	100, 115, 120
7mm International	100, 115, 120
.30 Herrett	110
.30-30 Winchester	110



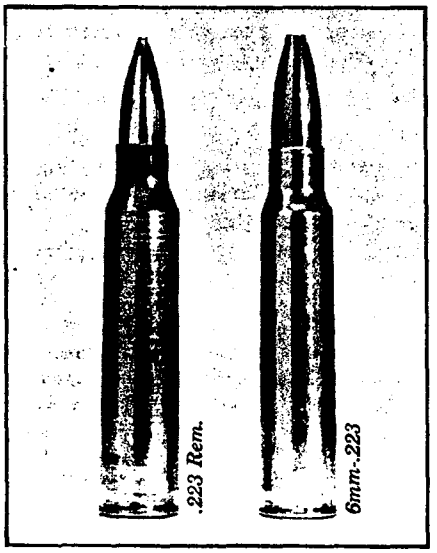
The MOA Maximum is a falling-block single shot that is chambered for a number of cartridges that will work nicely for long-range varminting when gun is scoped.

maybe a foot high and just 3 or 4 inches wide. A chuck will be at least twice this size. However, chucks aren't prone to showing themselves so brazenly—they more often flatten out on a rock or mound of dirt—so they can actually present a target that's tougher to hit than a prairie dog.

This should give you a hint as to what's required in the way of accuracy from your handgun. It must shoot as well as most varmint rifles. For long-range varminting, a handgun must be capable of groups no larger than 1½ inches at 100 yards, and I much prefer to use a pistol that will turn in five-shot groups of 1 inch or less at 100 yards. Downrange, then, I can expect—when everything is perfect—to get 2-inch groups at 200 yards, 3-inch groups at 300 yards, etc. However, seldom is everything perfect in the field. Shooting positions, wind, mirage—they all combine to make hitting those tiny distant targets mighty tough. That's why I say to consistently hit a varmint that's 4 inches wide, you've got to be shooting a pistol capable of one minute-of-angle accuracy or better.

Obviously, the specialty pistols are all that should be considered. Remington's XP-100, the Contender, the Wichita International, the MOA Maximum, Pachmayr's Dominator—these are some of the hand-

Sierra's Bob Ellison, left, and Bruce Cavey of Zeiss quickly became converts to long-range varminting.



Of these two favorites of Milek's, the .223 is tops because it is a commercially loaded cartridge.

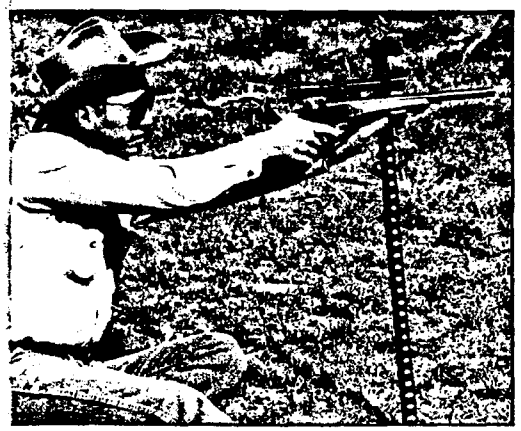
guns you'll be working with. Chambered for the right cartridge and fed a diet of carefully prepared handloads, every one of these pistols is capable of accuracy that eclipses that which you get from most sporting rifles.

Okay, you'll have to select a good specialty pistol. It should almost go without saying that open sights of any kind are out of the question. The only way you can extract the accuracy required for long-range varmint hunting from a good specialty pistol is to top the gun with a scope sight.

Pistol scopes today are a far cry from what they were just a few short years ago, so I recommend that you opt for a long or intermediate eye relief pistol scope. Some shooters prefer to use a rifle scope of 10X or 12X magnification, but I can't see the advantage of this today. Pistol scopes up to 10X magnification are available, and I don't know what more you could ask for.

When a rifle scope is used on a pistol, you must move your eye close to the eyepiece to locate your target. Then, when the reticle is set where you want it, you back your eye away from the scope and shoot, using just the tiny bit of field of view that's available. The only man I've ever known to be both proficient and fast using a 10X rifle scope on a pistol is Ron Reiber of Hornady. Most shooters find that the whole process is just more of a hassle than they want to put up with. I've tried the rifle scope idea, but I quickly went back to a good pistol scope.

Modern pistol scopes are available in a variety of magnifications, running from 1½X up through 10X. For long-range varmint shooting, I prefer high magnification. My favorite is the Burris 7X IER (intermediate eye relief). It seems to provide the combination of magnification and field of view that works best for me. Burris' 10X IER is a superb scope, but the field of view is tiny—4 feet at 100 yards—and placement of the eye in the exact optical center behind the eyepiece is critical. Even the slightest misalignment of the eye results in a total loss of the field of view of the scope. This problem does not exist with the 7X model, and the field of view at 100 yards is 7 feet, so this scope is much easier to use. I've pretty much relegated my 10X to use on a pistol for precision bench shooting only.



Use of a makeshift rest—in this case the MTM Walking Stick—works well when a quick shot is taken.

The beginner may have considerable trouble using even the 7X because of the limited field of view. Therefore, I recommend that if you're just getting started in the game you consider a pistol scope of 4X or 5X magnification. These have even larger fields of view and are much easier to learn to handle quickly.

There is always considerable disagreement among handgunners as to which of the specialty pistol designs is best. All are single shots, of course, but tip-up break-open, falling-block and bolt-action designs are available. All are strong actions and all are extremely accurate when fed the proper ammunition. Naturally, the bolt action is the strongest and most rigid, so you can probably expect slightly better accuracy than from other actions, but for the most part the accuracy edge is so slight that most shooters will never be able to notice it. The action strength debate is more academic than real.

Hornady's Ron Reiber shows what a good shot behind a good pistol is capable of, even out at 300 yards. The gun? An XP-100 in 6mm B.R.

Any of the single-shot pistol actions are strong enough to handle the cartridges for which they're chambered, providing that ammunition that's within industry pressure standards is used. The rub comes with wildcats—and we have a proliferation of these floating around. Without the proper equipment to measure chamber pressure, it's mighty easy to concoct a load whose pressure far exceeds that for which the gun is designed. Because modern pistols are well made, a few high-pressure loads will seldom cause any problem. However, metal fatigues, and if a pistol is fed a steady diet of high-pressure loads, it will eventually fail. The results can be disastrous for both the pistol and the shooter. Therefore, I hesitate to say that any one pistol action is stronger than another. Just keep your loads within industry standards, and you won't get into trouble.

One factor that does have a bearing on which type of pistol action you buy is the cartridges for which it is chambered. Some pistols have limited chamberings available; others offer just about anything you can think of. In addition, companies like SSK and Dennis Bellm Gunsmithing offer barrels for the Contender chambered for a number of wildcats. Then, too, if you pre-

continued on page 80

Small varmints such as the prairie dog require the use of a good quality handgun scope in the 7 power range.

This prairie dog hunter is using a makeshift rest to steady his hold. You need to secure a solid position to assure consistent hits on sod poodle-sized targets.

HANDGUN VARMINTING

continued from page 51

fer a particular action you can always have it barreled for the caliber you want. Customizing the XP-100 Remington has been a popular project in recent years, as has buying custom barrels in wildcat calibers for the Contender. About all I can say concerning action types is that you should choose the one you like best; then, if necessary, customize it with a barrel chambered for your favorite cartridge.

This brings us to the subject of cartridges for long-range varmint shooting with handguns. There are many that will suffice, both commercial and wildcat. Basically, the criteria for a good long-range varmint cartridge are high velocity (resulting in a flat trajectory) and superb accuracy. Of the cartridges for which pistols are commercially chambered, I think the two best for long-range varminting are the .223 Remington—available in just about every specialty pistol including the new Remington XP-100 Varmint Special with a 14½-inch barrel—and the 7mm Bench Rest Remington. Of the wildcats, I lean heavily toward the 6mm-.223 and the 6mm Bench Rest Remington. Thompson/Center Arms has announced that for 1986 they'll be offering Contender barrels for the 6mm T/CU. This should be an excellent cartridge, but since I've not yet had time to work with it, I'll have to reserve judgment for the time being.

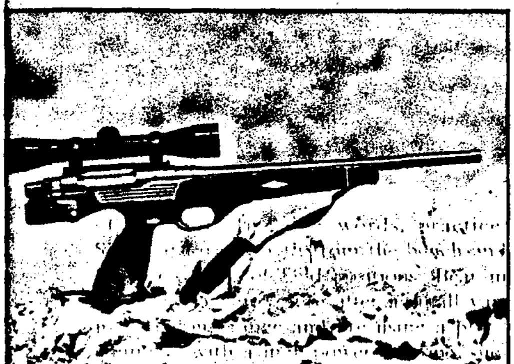
Now for those bullets—the final component for successful long-range varminting with a handgun. Because your targets are small, thin-skinned and usually inedible, it's important that a bullet be used that mushrooms or goes to pieces immediately on contact with a small, thin-skinned animal. Why? Because the target size alone precludes placing the bullet in the animal's vitals every time. It would be nice to hit the head or the chest every time, but it just doesn't happen that way. If the bullet being used is too hard and doesn't hit the vitals, it will cripple the varmint and it will escape, usually to die a slow, painful death. No sportsman can condone such an act. If an animal is worth hunting, it deserves to be killed quickly.

Therefore, you must choose bullets that will expand fast at handgun velocities. In .22 caliber I've found that explosive designs like the Hornady SX, Nosler Expander and Sierra medium-velocity Blitz give the desired performance. In 6mm and 7mm you'll want to use the lightest bullets available. The Sierra 60-grain hollow point in 6mm is good. Hornady now has a 70-grain 6mm SX that will be superb, offering both fast expansion on small targets along with a good ballistic coefficient for velocity retention at long range. In 7mm I've found the Hornady 100-grain HP to be a superb performer on varmints, and no bullet weighing more than 120 grains gives adequate expansion. In .30 caliber you'll have to content yourself with bullets weighing 110 grains. You may occasionally find a 125 or 130-grain bullet that will work on prairie dogs or chucks, but it will be the exception. Granted, the 110-grain .30 caliber bullets leave something to be desired at long range because of their poor ballistic coefficients, but there's nothing that can be done about this. Face it; .30 caliber in handguns is just a bit large in the bore to be great at long range on small targets.

Because velocity drops off sharply beyond 300 yards, even the thin-jacketed varmint bullets may not expand properly and provide a quick, humane kill. Because of this, shots should not be taken on varmints much beyond 300 yards, even though it is possible to hit the larger varmints out beyond 400 yards with the specialty pistols.

There's one last thing to watch for in bullets for handgun cartridges to be used for long-range varmint shooting. There are some lightweight bullets in many calibers that are designed especially for use in rifles at very high velocities. These will have extremely heavy jackets and you'll never get them to open at handgun velocities. They'll punch right through a prairie dog or chuck like a pencil, doing little tissue damage and in most cases failing to make a quick kill.

The handgun, the sight, the cartridge and the proper bullet—these are about all you need to get into the business of busting varmints at long range with a pistol. There is one final thing, though—shooting skill. This can be attained by simply doing a lot



Chambered In 7mm B.R., Remington's famous XP-100 sports a barrel of 15 inches, but retains nylon stock.

of shooting. In other words, practice: Shoot at targets both from the bench and from a variety of field positions. Bear in mind that when you're after a small varmint at long range and are using a pistol equipped with a high-powered scope, success will come regularly only when you shoot from a rested position of some kind. Practice shooting over sandbags spread out on a rock, over a daypack on the ground, over a rolled-up coat, or with a Harris Bipod attached to the fore-end of your pistol. Some serious long-range varminters go so far as to pack portable shooting benches into the field. What you use to steady your position is immaterial. The important thing is to practice so that you place the bullets right for quick one-shot kills. ■

G-88

DON'T SAY IT—*WRITE IT*

To File XP-100 ALL CALIBERS Date 4/15/86

From Terry Douglas

The barrel right side rollmark which shows the Design number and the Patent number will be removed from the XP-100 as a cost savings. I talked to William Erickson from Legal, who stated that it was not necessary. He stated that it was no problem to remove it.

"DON'T TAKE A CHANCE, THINK SAFETY IN ADVANCE"

file

TO: J. W. BOWER

FROM: T. C. DOUGLAS

4/18/86

SUBJ: MONTHLY REPORT - APRIL 1986

M/1100 IMPROVEMENTS

Piston/seals with the plant heat treatment, along with plant brazed barrels will be tested starting the week of April 21.

Associated Spring visited the Ilion plant on April 15th to discuss their fabrication problems with the gas springs. Drawings are being altered to facilitate vendor fabrication and clarification.

CHOKE TUBES - 20 GUAGE

Formal Transmittal of the 20 gauge choke tube package took place on March 17th. This design will be non-retrofittable for the M/1100 LT-20.

XP-100 IN .223 CALIBER

Eight guns were selected randomly from the warehouse for Trial and Pilot testing. Visual inspection along with accuracy and function testing was performed on April 17th. The guns passed, however the stocks need to have more care during fabrication. Every gun had some glue on the stock and/or poor baffling.

M/700 IN .338 WIN MAG CALIBER

Formal transmittal of the .338 BDL version for 1988 took place on April 1st.

M/7400 IMPROVEMENTS

A 90 gun design verification test of the 30-06 caliber M/7400 yielded the following:

1. Bolt modifications to ease assembly of the extractor and to prevent burr formation in the extractor groove worked very well. The DX malfunction rate with the current extractor was significantly improved by this bolt modification.
2. An extractor of current design, but .005" thicker had 3 DX malfunctions in 15,900 rds (.02%) versus the standard extractor's 17 DX malfunctions in 9,225 rds (.18%). A rivetless extractor made from the riveted design was dropped from test due to assembly and function problems.
3. Short action magazine boxes with long action followers performed better than std 30-06 magazine boxes.
4. Test guns with the thicker extractor and hybrid magazine boxes had an overall malfunction rate of 1.2% versus a standard gun malfunction rate of 2.8%.

Formal transmittal of the bolt modifications, thicker extractor, and magazine box (30-06 only) took place on April 7th.

Ultimate strength testing of the PBF extractor has been completed successfully. A 12 gun development test using 2 different extractor materials has been submitted to the test lab. This test will also include a maximum taper chamber test and single lip magazine box prototypes.

M/1100 20 GUAGE IMPROVEMENTS

It has been decided to not pursue a PC-type gas system for the LT-20 due to economic reasons (low volume). Orifices on the current guns will be "tweaked" for optimum performance. We will also test stainless steel magazine tubes. Prototype fore-ends for the LT-20 using the 20 gauge Special Field plunger detent system will be tested as a cost savings item. If successful, it will be carried over into the 28 and .410 guages also.

National 45-613 Eye-Ease 45-713 20 20 Buff Made in USA

XP-100 35 REMCAL DEVELOPMENT

ACCURACY FIRING - BAR - B7513899

MAY 14 → 86 ; W/SCOPE S#309, 2½ X SCOPE, BENCH,

	150 PSP FACT.		1 BEST FIVE SHOTS	2 BEST FOUR SHOTS	3 BEST THREE SHOTS	4 [redacted] VERTICAL (FIVE)	5 HORIZONTAL (FIVE)
1	"	MAY 14 '86 (50yds)	1.7	1.2	0.7	1.1	1.2
2	"	MAY 15 '86 (100yds)	2.1	1.6	0.9	1.6	1.4
3	"	MAY 16 '86 (100yds)	2.9	2.6	1.5	2.5	2.2
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21	200	MAY 14 '86 (50yds)	2.35	1.5	1.0	2.1	1.3
22	SP	MAY 15 '86 (100yds)	3.4	1.7	0.5	2.2	2.7
23	FACT.	MAY 16 '86 (100yds)	2.3	1.5	1.2	1.9	1.8
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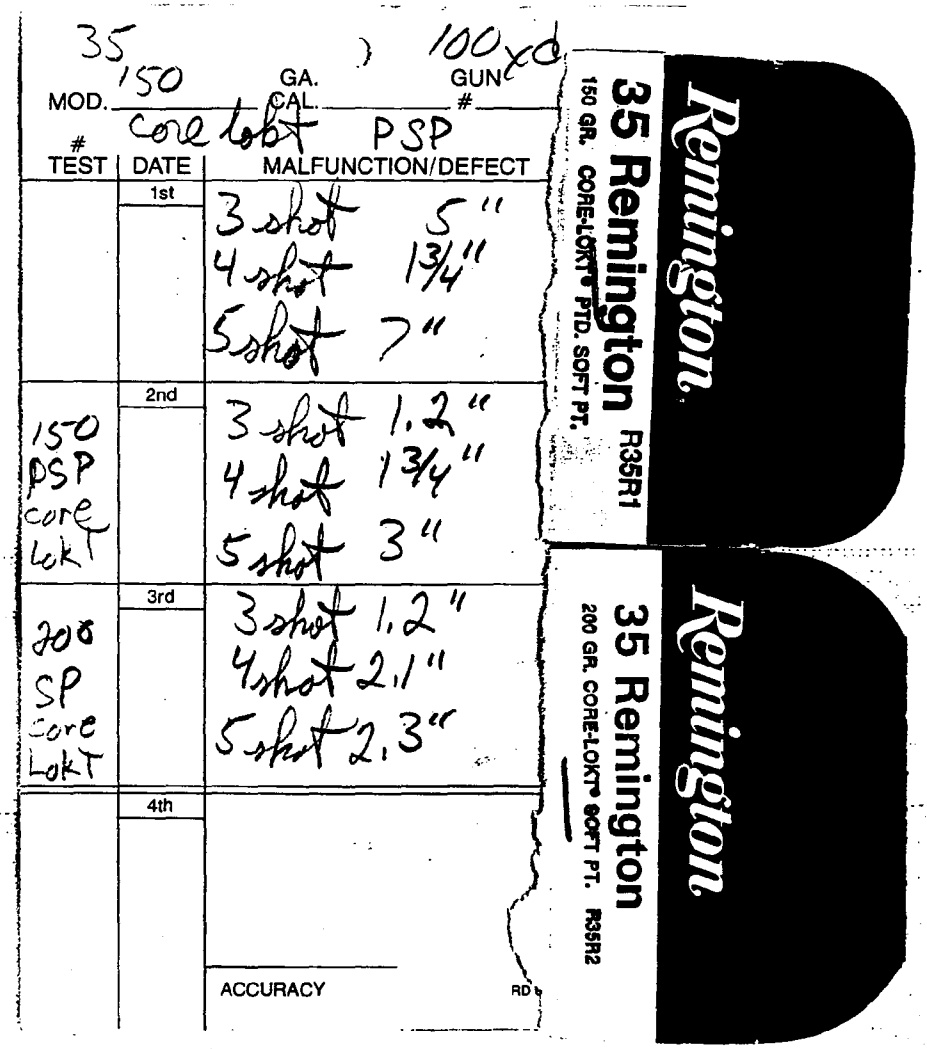


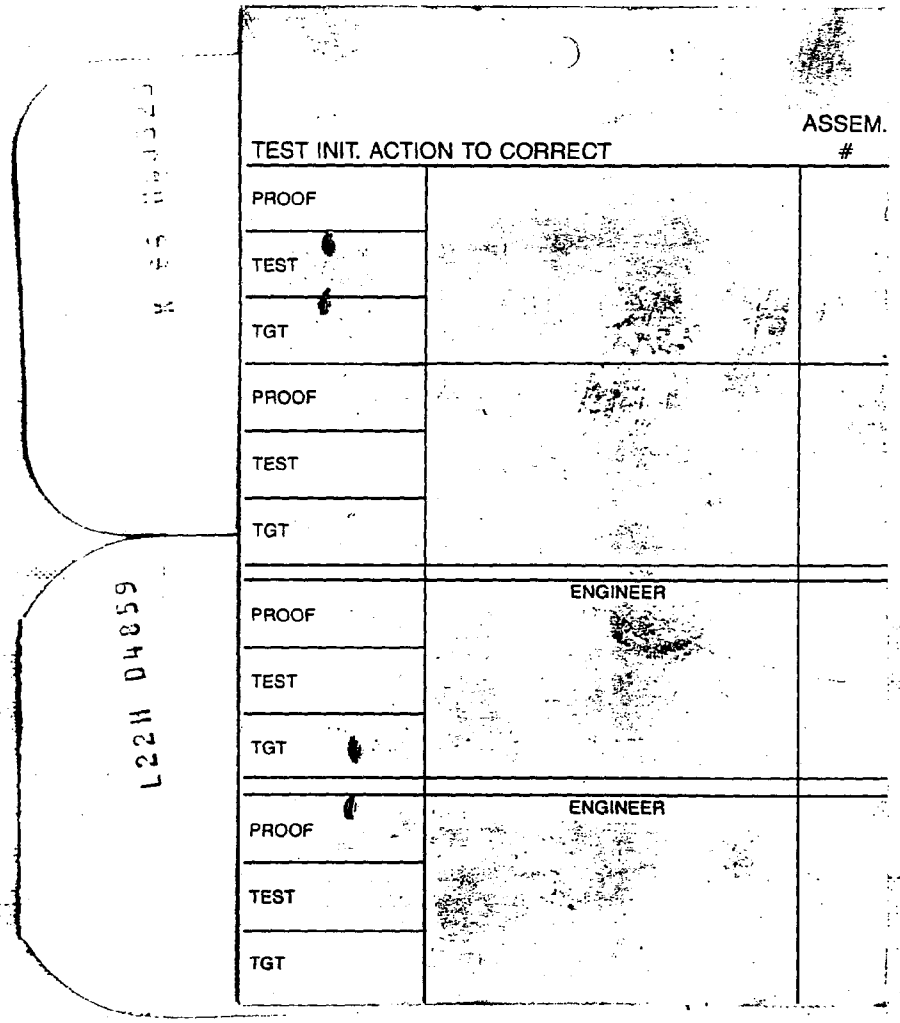
35 GA. 100 GUN #
MOD. 150 CAL. core lokt PSP #

TEST	DATE	MALFUNCTION/DEFECT
	1st	3 shot 5" 4 shot 1 3/4" 5 shot 7"
150 PSP core Lokt	2nd	3 shot 1.2" 4 shot 1 3/4" 5 shot 3"
200 SP core Lokt	3rd	3 shot 1.2" 4 shot 2.1" 5 shot 2.3"
	4th	

ACCURACY RD

Remington
35 Remington R35R1
150 GR. CORE-LOKT® PTD. SOFT PT.

Remington
35 Remington R35R2
200 GR. CORE-LOKT® SOFT PT.


TEST INIT. ACTION TO CORRECT
ASSEM. #
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ENGINEER
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L22H 04859

35 150 GA. CAL. 100 GUN #

MOD. core lokt PSP

# TEST	DATE	MALFUNCTION/DEFECT	ASSEM. #
	1st	3 shot 5" 4 shot 1 3/4" 5 shot 7"	
	2nd	3 shot 1.2" 4 shot 1 3/4" 5 shot 3"	
	3rd	3 shot 1.2" 4 shot 2.1" 5 shot 2.3"	
	4th		

ACCURACY RD 6668 Rev 1

GALLERY LOT

LAB LOTS.

K06H MD0525

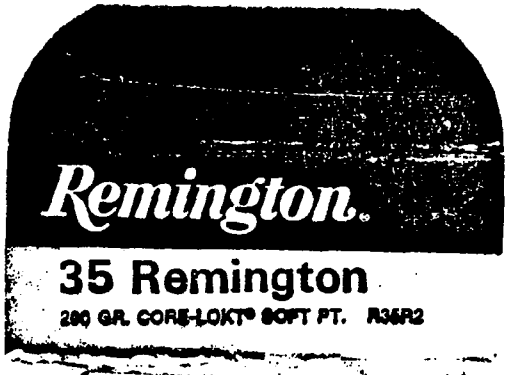
COMMENT

VERY GOOD! INDICATIONS ARE THAT GALLERY ACCURACY DATA CAN HANDLE HEAVY (16gr.) RECOIL WITHOUT ANY MODIFICATIONS. (NICE)

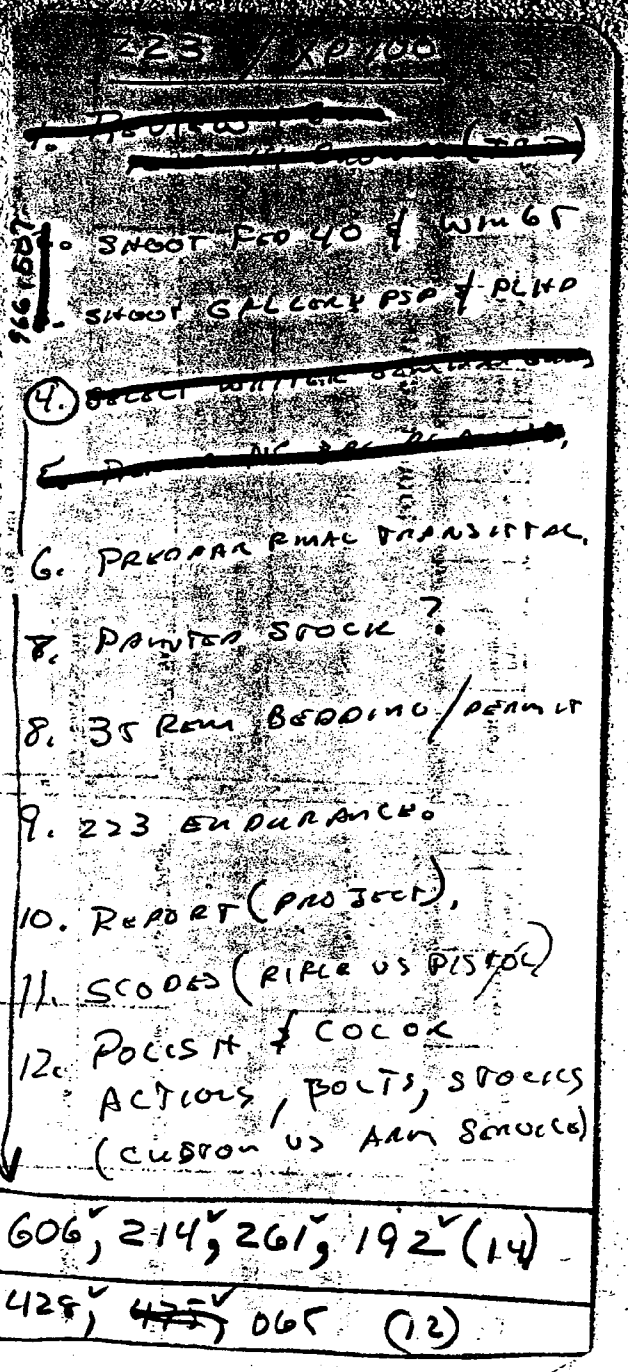
MAY '96

A/A W.

GALLERY LOT WAS A VERTICAL STRING.



L22H D4655


223 / XP 100
1.
2. SHOOT P20 40 ¢ WIN 65
3. SHOOT GALLERY P20 ¢ PLATO
4.
5.
6. PROGRAM RMAC TRANSITAL
7. PAINTED STOCK ?
8. 35 REM BEDDING / PERMIT
9. 223 ENDURANCE
10. REPORT (PROJECT),
11. SCOPES (RIFLE VS PISTOL)
12. POLISH ¢ COLOR
ACTIONS / BOLTS, STOCKS
(CUSTOM VS ARM SMITH)
606✓, 214✓, 261✓, 192✓ (14)
425✓, 47-✓ 065 (12)

G-88

DON'T SAY IT—*WRITE IT*

To ADAM HUGICK Date 6/6/86

From Jim Rontainen

Based on a material strength of 95000 psi (.2% offset yield strength) and a 1.25 factor of safety (implying a allowable max stress of $\frac{95000}{1.25} = 76000$ psi), your contour looks good.

"AN UNGUARDED MINUTE HAS AN ACCIDENT IN IT"

FIELD CYCLE TEST - CENTERFIRE

REPROT NO.: ______ PAGE NO. ______

PREVIOUS ROUNDS 95

DATE: Tue 4/8 MODEL: XP10C GAUGE: 35 Rem SERIAL NO. B7513899

TEST TITLE XP100 DESIGN TEST

TTL. RDS. FIRED:
TTL. MALFUNCTIONS:
MALFUNCTION RATE:

"MALFUNCTIONS"

XP100 35	SHOOTER	NO. OF ROUNDS FIRED	FIRING	TRAPPED SHELL	DON'T EJECT	DON'T BLOW BACK	DON'T LOCK OPEN	FEED FROM MAG. 1st LATCH	FEED FROM MAG. 2nd LATCH	SHELL STEMS MAG.	POWER OVERRIDE	DON'T LOCK UP	STEM CHAMBER HIGH	STEM CHAMBER LOW	STEM CHAMBER RIGHT	STEM CHAMBER LEFT	SHELL JUMPS MAG.	FOLLOWER BINDS	LOADING	BOLT OVERRIDE	ACTION HANG UP	DON'T EXTRACT	BREAKAGES	ADJUSTMENTS	REPLACEMENTS			
R35R2	A.	100				IN	SPE	CTE	D	ST	OC	K	[illegible]	JO	INT		WO	UES	RO	AR	OR	PO	WARD	ESS	[illegible]	[illegible]	[illegible]	
R35R1	A.	100																										
			5	LI	GH	T	IN	DE	NT																			
TOTAL (PER MAL.)																												

AQUEOUS PHENOL

RESORCINOL-ETHANOL

NYLON-BODIED CALCIUM CHLORIDE-ETHANOL

3 ZYTEL CEMENTING & ADHESIVE BONDING GLOV

June 6 86

WORK ORDER # C0801-307-Y

XP100 - ADDITIONAL CALIBERS (35 REM).

(12) TWELVE. BARRELED ACTIONS

ADAM HUGICK (461)

* WILL BE OUT OF PLANT JUNE 9 → 13, 86

* HAVE BEEN DRAW FILED TO REMOVE MOST OF BARREL CHATTER MARKS WHICH OCCURRED @ THREAD PROFILE.

12 MORE THREAD'D (2 PASSED) A.
AND DELIVERED TO FINISHING SHOP 6/11/86

SERIAL NUMBER	CALIBER	NOTES
B7510477	308 WIN.	—
B7516103	223 REM.	—
B7514311	308 WIN	—
B7510556	223 REM	—
B7506033	NONE LISTED	—
B7514009	223 REM	—
B7513713	308 WIN	—
B7509847	7MM-08 REM	—
B7505993	221 REM	SIGHTS - SHOTGUN
B7513096	308 WIN	—
B7506018	7MM BR REM	—
B7513226	308 WIN	—
B7512645	~~450~~ 7MM-08 REM	—
B7513226	308 WIN	—
B7506066	7MM MS	—

TOTAL COUNT = 15 GUNS

ABOVE XP100 INVENTORY IS SCHEDULED FOR RE-BARREL TO THAT OF 35 REM FOR DESIGN TEST, FIELD TEST, AND SPOTS WRITER SAMPLES. THIS WILL TAKE PLACE IN THE REMINGTON-ILION CUSTOM GUN SHOP. THE GUN MAY BE LIGHT WEIGHT AND EXTRA SAMPLES WILL BE PREPARED SUCH THAT FALL OF 86 DEER SEASON CAN BE A TEST OF THIS AREA OF PRODUCT DESIGN. 6/6/86 AAH

CONFIDENTIAL

REMINGTON RESEARCH
2Q86 QUARTERLY REPORT
JUNE 18, 1986

Distribution

L.F. Nonemaker - Wilmington
W.H. Coleman, II
J.W. Bower
W.L. Ericson
J.C. Hutton
C.E. Ritchie
J.R. Snedeker
File

HIGHLIGHTS

HIGHLIGHTS

CUT CHECKERING OF WOOD COMPONENTS — PAGE #

Successful turnover to production of the new checkering equipment was completed in 2Q86. Two technical achievements which have resulted are: 1) a mechanical floating head system to follow stocks individually and 2) a high velocity vacuum system to collect fine dust. 3

GFM AUTOMATION

Installation of the second robot system in the GFM machining area is 95% complete. The first system is currently running production. 3

AUTOMATED FLEXIBLE SUB-ASSEMBLY

Two of the three assembly workstations have been shipped to Ilion. Further work remains to be completed on the third workstation to eliminate problems encountered during its development. 3

PRODUCT DEVELOPMENT

SYNTHETIC STOCKS AND FORE-ENDS

Remington Research, with concurrence of the Firearms Business Team, is leading an effort with PPD and commercial molders, to substitute high performance synthetic materials for wood shotgun and rifle stocks and fore-ends. Acceptance of synthetics has come about through the use of expensive custom-made fiberglass stocks by serious centerfire shooters desiring exceptional durability under adverse environmental conditions.

The initial offering will be a Model 700 centerfire rifle set in a Rynite stock. This injection molded stock will provide all of the functional performance of fiberglass, but can be produced at one third the cost of walnut. The product will be included in the 1987 catalogue.

MODEL 11-87

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In addition to gun part development the standalone T-10 is now being used to machine XP9 parts for the Polymer Products Department to meet schedules for a high priority critical project. Production start up of this component was accomplished in approximately 5 weeks. This was possible due to the flexibility of this equipment.

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- A mechanical floating system has been installed on a 4 spindle Bostomatic CNC machine to follow the varying contours on 4-individual gun stocks simultaneously. The magnetically retained following devise for this machine has recently been accepted as the standard for two other machines, the Co.Re.Ma. Italian fore-end checkering machine and an Ekstrom Carlson Machine now being installed by the plant.

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GFM AUTOMATION - Contd.

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JWBOWER:js

Next report perhaps should submit 1187

2) File Quarterly Stockholders report

CC: R. A. Darby
B. C. Anderson
G. A. Massih, Jr.
C. R. Smoot
A. G. Armour
W. H. Coleman, II
A. W. Andresen
A. F. Nugent
A. P. Trei, EAD
ANX 218

AUTOMOTIVE PRODUCTS DEPARTMENT
R&D DIVISION

J. E. Lohr
Corporate R&D Planning
D-6018

2Q86 STOCKHOLDERS REPORT
CONTRIBUTION

Our contribution to the 2Q86 Stockholders Report follows:

CORIAN® SATIN GRAY INTRODUCED

Corian® Products announced a new color, Satin Gray, in response to the latest design trends in kitchens and baths. Satin Gray joins three current colors, Cameo White, Dawn Beige and Almond, in the Corian® line and offers the market an even wider range to meet the needs of the consumer. Satin Gray is now available in distributor's stocks in all three standard sheet thicknesses.

L. F. Nonemaker

P.S. - Color Photos are available if desired. Contact Alan Trei, EAD, 48273.

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REMINGTON RESEARCH
2Q86 QUARTERLY REPORT
JUNE 18, 1986

Revised Copies

6/26/86

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In addition to gun part development the standalone T-10 is now being used to machine carriers for the Polymer Products Department to meet schedules for a high priority Mylar Tenterframe project. Production start up of this component was accomplished in approximately 5 weeks. This aptly demonstrated the flexibility of this equipment.

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JWBOWER:js

A. A. HUGICK
(461)
JULY 25 '86

XP100-35 REM — (C0801-307 Y) —

- ASSEMBLE IN PRODUCTION:
  - TRIGGER ASSEMBLIES
  - FIRING PIN ASSEMBLIES

- TEST IN PLANT GALLERY:
  - PROOF
  - ACCURACY IN FIXTURE
  - FUNCTION NORMAL W/ XP'S

- INSPECT IN FINAL INSPECTION:

- ASSEMBLE PRODUCTION STOCKS:

- RETURN TO R&D FOR DESIGN TEST:
  - ACCURACY (100 yds) FROM BENCH
  - FUNCTION WITH ABOVE
  - SUMMARIZE DATA ~ (3½ INCHES @ 100 yds)
  - ENDURANCE IN SOFT REST
    - X FOR STOCK JOINT ENDURANCE
      - * PRODUCTION STOCK(S)
      - * EXPERIMENTAL ST801
      - * EXPERIMENTAL JOINT ADHESION,

[redacted]

Report accepted
10/14/96

1295004794

(13)

AUG. 21, 86

XP-100 35 REM DESIGN TEST

THESE XP100 35 REM BOLT ACTION PISTOLS MAYBE USED FOR WRITER SEMINAR GUNS AND/OR ILION SITE DEER HUNTING FIELD TEST GUNS. PLEASE HANDLE WITH CARE.

THANKS!

THE 35 REM IS AN ADDITIONAL CALIBER TO EXISTANT XP 100 PRODUCT LINE.

PROPOSED TEST AREA CONSIDERATION AS VIEWED FROM DESIGN.

I. HEADSPACE - MIN. AND MAX.

THE LAB GAGES ARE LOCATED IN CUSTOM SHOP (WAYNE CABLE) AND WERE CONFIRM ILL THEIR GAGES WERE READ 60.

II. ACCURACY - FIRE TWO FIVE SHOT GROUP PER GUN, SCOPED, FROM A BENCH AT AIM TARGET.

(X) ONE GROUP WITH R150

(X) ONE GROUP WITH R200

DO NOT PUT TARGET ON COMPUTER - INSTEAD READ [redacted] FIVE SHOT GROUP SIZE, BEST FOUR SHOTS IN GROUP, AND BEST TWO.

3 SHOTS IN GROUP.

NOTE MALFUNCTION EXPERIENCED WHILE SHOOTING ACCURACY.

III. SELECT A BEST GROUP AND A WORST GROUP AND FIRE ACCURACY WITH WIN. AND FED. 35 REM. CALIBER AMMO'S

IV. STOCK JOINT ENDURANCE

FIRE ONE GUN TO A 1000 ROUND LEVEL WITH GUN FIXTURED IN JACK PLACED SOFT RECOIL PAD TO INSPECT STOCK JOINT EVERY 200 ROUNDS FOR GLUE BOND FAILURE. RECORD AND MARK PER INDICATE SEPARATION LENGTHS EXPERIENCED.

NOTE MALFUNCTIONS EXPERIENCED WHILE SHOOTING ACCURACY

STOCK JOINT SEPARATION MAY FIRST OCCUR AT FRONT OF OR NEAR STOCK SCREW LOCATION INSIDE OF STOCK ADJACENT TO RECOIL LUG.

FUTURE ON CONTINGENT IGT ACTIVITY MAY FOLLOW WITH THE FOLLOWING.

- BLACK EXPERIMENTAL ST801 (SI SHAMTUAL BYTER STOCK MATERIAL.
- NYLON BODIED CALCIUM CLORIDE ETHAN ADHESIVE - DOCUMENTS THIS MATERIAL IS NON-TOXIC WHILE PHENOWETO ISTO.
- IRONSIGHTS — EIT, POI/POA, ARMS
- MARNA PORTING —

SPECIAL TEST REPORT

MODEL XP100 35 SHOOTER — DATE 8 08 86

Gun No.	Ga./Cal.	Heavy Jack Rds.	Heavy Jack Type	Heavy Jack Results	Light Jack Rds.	Light Jack Type	Light Jack Results
6066 ✓	35	5	200	2.0 ACTION USED IN ENDURANCE ① ② ③			
4009 ✓		5	↓	2.2 x Stock used in endurance ③			
4311 ✓		↓	↓	1.5			
6018 ✓		↓		1.5			
5993 ✓				2.0			
0556 ✓				2.0			
3713 ✓				2.5 ACTION USED IN ENDURANCE ④ ③ ⑥			
6033 ✓				1.5			
2645 ✓				1.5			
3096 ✓				1.5			
0477 ✓				1.7			
0588 ✓				1.5 x Stock used in Endurance ②			
3226 ✓				1.5			
6033 ✓				1.5			

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B7510556	223-REM	—
B7506033	NAME LISTED	—
B7514009	223 REM	—
B7513713	308 WIN ✓	—
B7509847 SCRAP-RETRIEVED	7MM-08 REM ✓	—
B7505993	221 REM	SIGHTS - SMOOTH
B7513096	308 WIN ✓	—
B7506018	7MM BR REM ✓	—
B7513226 D	308 WIN ✓	—
B7512645	7MM-08 REM ✓	—
B7513226	308 WIN ✓	—
B7506066	7MM MS ✓	—
? 0588 — CASING ONLY		

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June 6 '86

WORK ORDER - C0801-307-Y DM

$100 - ADDITIONAL CALIBERS
(35 REM)

(12) HOCUS
[redacted] BARRETTE ACTIONS
15?

ADAM HUGICIC (461)

* WILL BE OUT OF PLANT JUNE 9 → 13, 86

35 REM CHAMBERS

FRONT SIGHT & SIGHT HOLES
[illegible] & REAR

15"
700 CROWN

SEPT 18 '86

TRANSMITTAL

B7513096
B751603
TO TIM
FOR
'87 WRITER SEMINAR
10/29/86
~~10/11/86~~
AAH

DUPONT **RECORDS CONTROL SCHEDULE**

RECORDS CATEGORY OR TITLE:

COPY "O" (OFFICIAL) ☐ "X" (EXTRA) ☐

TOTAL RETENTION: _____

GS-11050 Rev. 8/78

XP-100-35 REM

TRY # 10+

9/17

Report No. _____

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

	AREA OF TESTING	
____ Developmental	____ Safety Related	____ Litigation
_X_ Design Acceptance	____ Competitive Evaluation	____ Warehouse Audit
____ Pre-Pilot	_X_ New Design (CAL ADDITION)	____ Cost Reduction
____ Pilot	____ Design Change	Stake _____
____ Production Acceptance	____ Plant Assistance	____ Other

FIREARM STAT'S.	REPORT REQ'D.	
MODEL: XP-100	FORMAL _____	DATE REQUESTED: Aug. 21 86
CAL or GAGE: 35 REM	TEST RESULTS ONLY X(1)	DATE NEEDED BY: Sept 15 86
BARREL TYPE: EXP		REQUESTED BY: A. A. HUGICK
PROOFED: YES ____ (DONE IN GALLERY) NO ____		WORK ORDER NO: [redacted] C0801

TEST TYPE

____ Strength Test	____ Ammunition Test	____ Dry Cycle Test	____ Photo/Video
_X_ Function Test	____ Environmental Test	____ Measurements	____ Other _____
_X_ Accuracy Test	____ Customer Complaint	_X_ Endurance Test	_____

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

PER SUGGEST OUTLINE ATTACHED.

GUNS REQUIRED:

(1) HAVE OTHER DATA TO INCLUDE IN DESIGN TEST REPORT. AAH.

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: _____

TEST COMPLETED BY: _____

REPORT DATE: _____

AUG. 21, 86

XP-100 35 REM DESIGN TEST

THESE XP100 35 REM BOLT ACTION PISTOLS MAYBE USED FOR WRITER SEMINAR GUNS AND/OR ILION SITE DEER HUNTING FIELD TEST GUNS. PLEASE HANDLE WITH CARE.
THANKS!

THE 35 REM IS AN ADDITIONAL CALIBER TO EXISTANT XP 100 PRODUCT LINE.

PROPOSED TEST AREA CONSIDERATION AS VIEWED FROM DESIGN.

I. HEADSPACE - MIN. AND MAX.
THE LAB GAGES ARE LOCATED IN CUSTOM SHOP (WAYNE CABLE) AND WERE LOANED TILL THEIR GAGES WERE READIED.

II. ACCURACY - FIRE TWO FIVE SHOT GROUP PER GUN, SCOPED, FROM A BENCH AT A100yd TARGET.
(X) ONE GROUP WITH R150
(X) ONE GROUP WITH R200.
DO NOT PUT TARGET ON COMPUTER-
INSTEAD READ ~~BEST~~ FIVE SHOT GROUP SIZE, BEST FOUR SHOTS IN GROUP, AND BEST THREE

SHOTS IN GROUP.

NOTE MALFUNCTION EXPERIENCED WHILE SHOOTING ACCURACY.

III. SELECT A BEST GROUPER AND A WORST GROUPER AND FIRE ACCURACY WITH WIN. AND FED. 35 REM CALIBER AMMOS.

IV. STOCK JOINT ENDURANCE

FIRE ONE GUN TO A 1000 ROUND LEVEL WITH GUN PLATFORM IN JACK PLACED SOFT RECOIL REST. INSPECT STOCK JOINT EVERY 200 ROUNDS FOR GLUE BOND FAILURES. RECORD AND MARK ON BARREL SEPERATION LENGTHS EXPERIENCED.

NOTE MALFUNCTIONS EXPERIENCED WHILE SHOOTING ACCURACY.

STOCK JOINT SEPERATION MAY FIRST OCCUR ~~AT~~ FRONT OR NEAR STOCK SCREW LOCATION INSIDE OF STOCK, ADJACENT TO RECOIL LUG.

FUTURE OR CONTINGENT TEST ACTIVITY MAY FOLLOW WITH THE FOLLOWING.

- BLACK EXPERIMENTAL ST801 (ST SUPERTUFF) ZYTEL STOCK MATERIAL.
- NYLON BONDED CALCIUM CLORIDE ETHANO ADHESIVE - SOLVENTS. THIS MATERIAL IS NON-TOXIC WHILE PHENOWELD IS TOXIC
- IRONSIGHTS - FIT, POI/POA, ADJUST.
- MAGNA PORTING -

RD 6681 Sheet ____ of ____

SPECIAL TEST REPORT

MODEL XP100 35 SHOOTER _____ DATE 80886

Gun No.	Ga./ Cal.	Heavy Jack Rds.	Heavy Jack Type	Heavy Jack Results	Light Jack Rds.	Light Jack Type	Light Jack Results
6066 ✓	35	5	200	2.0			
4009 ✓		5	↓	2.2			
4311 ✓		↓	↓	1.5			
6018 ✓		↓		1.5 ✓			
5993 ✓				2.0			
0556 ✓				2.0			
3713 ✓				2.5			
6033 ✓				1.5			
2645 ✓				1.5 ✓			
3096 ✓				1.5			
0477 ✓				1.7			
0588 ✓				1.5			
3226 ✓				1.5			
6033 ✓				1.5			

June 6 86

WORK ORDER # C0801-307-Y

$100 - ADDITIONAL CALIBERS
(.35 REM)

(12) [redacted] BARRELED ACTIONS
15?

ADAM HUGERIC (461)

* WILL BE OUT OF PLANT, JUNE 9 → 13, 86

35 REM C HAMBERS

FRONT SIGHT & SIGHT HOLES
FRONT & REAR

15"

700 CROWN

SERIAL NUMBER	CALIBER	NOTES
B7510477 D	308 WIN. ✓	—
B7516103 ? (NOT HERE)	223 REM.	—
B7514311 D	308 WIN ✓	—
B7510556 D	223-REM	—
B7506933 D	NONE LISTED	—
B7514009 D	223 REM	—
B7513713 D	308 WIN ✓	—
B7509847 SCRAP-RETURNED	7MM-08 REM ✓	—
B7505993 D	221 REM	SIGHTS-SHOTGUN
B7513096 D	308 WIN ✓	—
B7506018 D	7MM BR REM ✓	—
B7513226 D	308 WIN ✓	—
B7512645 D	7MM-08 REM ✓	—
B7513226 D	308 WIN ✓	—
B7506066 D	7MM MS ✓	—
? 0588 — CHECK 2 MORE REC.		

TOTAL COUNT = 15 GUNS

ABOVE EXP100 INVENTORY IS SCHEDULED FOR RE-BARREL TO THAT OF 35 REM FOR DESIGN TEST, FIELD TEST, AND SPOOLS WALTON SAMPLES. THIS WILL TAKE PLACE IN THE REMINGTON-ILION CUSTOM GUN SHOP. THE GUN MAKES LIGHT WEIGHT AND EXTRA SAMPLES WILL BE PREPARED SUCH THAT FALL OF 86 DEER SEASON CAN BE A TEST OF THIS AREA OF PRODUCT DESIGN. 6/6/86 AAH

Report No. 862332

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

	AREA OF TESTING	
____ Developmental	____ Safety Related	____ Litigation
X Design Acceptance	____ Competitive Evaluation	____ Warehouse Audit
____ Pre-Pilot	X New Design (CAL ADDITION)	____ Cost Reduction
____ Pilot	____ Design Change	Stake ____
____ Production Acceptance	____ Plant Assistance	____ Other

FIREARM STAT'S.

MODEL: XP-100

CAL or GAGE: 35 REM

BARREL TYPE: EXP

PROOFED: YES DONE IN-HOUSE NO ____

REPORT REQ'D.

FORMAL ____

TEST RESULTS ONLY X(1)

DATE REQUESTED: AUG. 21 '86

DATE NEEDED BY: SEPT 15 '86

REQUESTED BY: A. A. HUGICK

WORK ORDER NO: [redacted] - xxx

C0801-

TEST TYPE

____ Strength Test	____ Ammunition Test	____ Dry Cycle Test	____ Photo/Video
X Function Test	____ Environmental Test	____ Measurements	____ Other ____
X Accuracy Test	____ Customer Complaint	X Endurance Test	____

EXPLAIN IN D

PE

I FIND HANDGUN ACCURACY TESTS EASY TO THROW A SHOT OR TWO AND THIS IS WHY I READ:

- FIVE SHOT GROUP DATA
- BEST FOUR SHOTS IN GROUP
- BEST THREE SHOT IN GROUP.

GUNS REQUIRED:

(1) HAVE OTHER DATA TO INCLUDE IN DESIGN TEST REPORTS AAH,

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: ____

TEST COMPLETED BY: ____

REPORT DATE: ____

DATE: 8-28-86 MODEL: XP100 CALIBER: 35 SERIAL NO. B7506066

PREVIOUS ROUNDS: ____

TEST TITLE: STOCK #3

TTL. RDS. FIRED: ____
TTL. MALFUNCTIONS: ____
MALFUNCTION RATE: ____

"MALFUNCTIONS"

	SEQUENCE	NO. OF ROUNDS FIRED	FIRING	FAILED SEAR	DON'T FIRE	DON'T SET BACK	DON'T LOCK OPEN	FEED FROM MAG. 1st LATCH	FEED FROM MAG. 2nd LATCH	SEAR STRIKES MAG.	POWER OVERCOME	DON'T LOCK UP	OTHER CHAMBER: FIRE	OTHER CHAMBER: EJECT	OTHER CHAMBER: FEED	OTHER CHAMBER: LOCK	SEAR STRIKES MAG.	FOLLOWER STICKS	LOADING	BOLT OVERRIDES	ACTION SLAM UP	DON'T EXTRACT	BREAKAGES	ADJUSTMENTS	REPLACEMENTS			
	HEW	100	OK																								
2	HEW	100	OK																								
3	HEW	100	OK																								
4	HEW	100	OK																								
5	HEW	100	OK																								
6	HEW	100	OK																								
7	FLS	100	OK																								
8	FLS	100	OK																								
9	FLS	100	OK																								
1000																											
TOTAL (PER MAL.)																											

[illegible] — CENTERFIRE

REPROT NO.: ______ PAGE NO. 1

PREVIOUS ROUNDS ______

DATE: 8-27-86 MODEL: XP100 CALIBER 35 SERIAL NO. B7506066

TEST TITLE: ______ G STOCK #2

TTL. RDS. FIRED: ______
TTL. MALFUNCTIONS: ______
MALFUNCTION RATE: ______

"MALFUNCTIONS"

	SHOOTER	NO. OF ROUNDS FIRED	[illegible]	[illegible]	DON'T [illegible]	DON'T BLOW BACK	DON'T LOCK OPEN	FEED FROM MAG. 1st LATCH	FEED FROM MAG. 2nd LATCH	SHELL STAYS MAG.	POWER OVERRIDE	DON'T LOCK UP	STEM CHAMBER [illegible]	STEM CHAMBER [illegible]	STEM CHAMBER [illegible]	STEM CHAMBER [illegible]	SHELL JUMPS MAG.	FOLLOWER BINDS	LOADING	BOLT OVERRIDE	ACTION HANG UP	DON'T [illegible]	[illegible]	ADJUSTMENTS	REPLACEMENTS			
	HW	100	OK																									
	HW	100	OK																									
	HW	100	OK																									
	HW	100	OK																									
	HW	100	OK																									
	HW	100	OK																									
	HW	100	OK																									
	HW	100	OK																									
	HW	100	OK																									
	HW	100	OK																									
TOTAL (PER MAL.)																												

PAGE NO. 1

PREVIOUS ROUNDS

DATE: 8-26-86 MODEL: XP100 CALIBER 35 (#1) SERIAL NO. B7506066

TEST TITLE.

TTL. RDS. FIRED:
TTL. MALFUNCTIONS:
MALFUNCTION RATE:

"MALFUNCTIONS"

	[illegible]	NO. OF ROUNDS [illegible]	[illegible]	[illegible]	DON'T [illegible]	DON'T [illegible] BACK	DON'T LOCK [illegible]	FEED FROM MAG. 1st LATCH	2nd LATCH	SHELL STEMS MAG.	POWER OVERRIDE	DON'T LOCK UP	OTEH CHAMBER [illegible]	[illegible]	[illegible]	[illegible]	SHELL JUMPS MAG.	FOLLOWER BINDS	LOADING	BOLT OVERRIDE	ACTION BIND UP	DON'T EXTRACT	[illegible]	[illegible]	[illegible]			Remarks
	HW	100	OK																									
	HW	100																										X
	HW	100	OK																									
	HW	100	OK																									
	HW	100	OK																									
	HW	100	OK																									
	HW	100	OK																									
	HW	100	OK																									
	HW	100	OK																									
	HW	100	OK																									
TOTAL (PER MAL.)																												

G-88

DON'T SAY IT—*WRITE IT*

To _____

From _____

Date _____

1000 rds - Split from same 4

1 1000 same as 4

2 -O/K

3 1000 same as 4

4 1000 Slight split rear of front take down screw

5. 2000 rds ½" long front & rear of front hole

6. 2000 split @ Front take down screw Front & rear of front screw

"AN UNGUARDED MINUTE HAS AN ACCIDENT IN IT"

PAGE NO. 1

PREVIOUS ROUNDS: 0

DATE: 9/4/86 MODEL: XP 135 CALIBER: 35 Rem SERIAL NO. B75/3713

TEST TITLE: Stock "c"

TTL. RDS. FIRED:
TTL. MALFUNCTIONS:
MALFUNCTION RATE:

"MALFUNCTIONS"

	SHOOTER	NO. OF ROUNDS FIRED	FIRING	[illegible]	DON'T [illegible]	DON'T [illegible] BACK	DON'T LOCK OPEN	FEED FROM MAG. 1st LATCH	FEED FROM MAG. 2nd LATCH	SHELL STOPS MAG.	POWER OVERRIDE	DON'T LOCK UP	OPEN CHAMBER [illegible]	OPEN CHAMBER [illegible]	OPEN CHAMBER [illegible]	OPEN CHAMBER [illegible]	SHELL JUMPS MAG.	FOLLOWER BINDS	LOADING	BOLT OVERRIDE	ACTION HANG UP	DON'T [illegible]	[illegible]	ADJUSTMENTS	REPLACEMENTS			
R35R1	DT	100																										
R35R1	DT	100																										
R35R1	LT	100																										
R35R1	DT	100																										
R35R1	DT	100																										
R35R1	DT	100																										
R35R1	DT	100																										
R35R1	DT	100																										
R35R1	DT	100																										
R35R1	DT	100																										
TOTAL (PER MAL.)																												

CENTERFIRE | METHOD NO.: | PAGE NO. 2

PREVIOUS ROUNDS 1000

DATE: 9/5/86 | MODEL: XP100 | CALIBER 35 Rem | SERIAL NO. B7513713

TEST TITLE. Stock #5

TTL. RDS. FIRED:
TTL. MALFUNCTIONS:
MALFUNCTION RATE:

"MALFUNCTIONS"

	SHOOTER	NO. OF ROUNDS FIRED	[illegible]	FLATTENED SHELLS	DON'T [illegible]	DON'T BLOW BACK	DON'T LOCK OPEN	FEED FROM MAG. 1st	FEED FROM MAG. 2nd LATCH	SHELL STEMS MAG.	POWER OVERRIDE	DON'T LOCK UP	OPEN CHAMBER [illegible]	OPEN CHAMBER [illegible]	OPEN CHAMBER [illegible]	OPEN CHAMBER [illegible]	SHELL JAMS MAG.	FOLLOWER BINDS	LOADING	BOLT OVERRIDE	ACTION BAR UP	DON'T [illegible]	[illegible]	[illegible]	[illegible]			
R35R1	DT	100																										
R35R1	DT	100																										
9/8 R35R1	DT	100																										
R35R1	DT	100																										
R35R1	DT	100																										
R35R1	DT	100																										
R35R1	DT	100																										
R35R1	DT	100																										
R35R1	DT	100																										
R35R1	DT	100																										
TOTAL (PER MAL.)																												

PAGE NO. ______

DATE: 9/8/86 MODEL: XP100 CALIBER: 35 Rem SERIAL NO. B7513713

PREVIOUS ROUNDS ______

TEST TITLE: Stock #6

TTL. RDS. FIRED: ______
TTL. MALFUNCTIONS: ______
MALFUNCTION RATE: ______

"MALFUNCTIONS"

PREVIOUS ROUNDS	[illegible]	NO. OF ROUNDS [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	FEED FROM MAG. 1st	FEED FROM MAG. 2nd LATCH	SHELL STEMS MAG.	POWER OVERRIDE	DON'T LOCK UP	OPEN CHAMBER [illegible]	OPEN CHAMBER [illegible]	OPEN CHAMBER [illegible]	OPEN CHAMBER [illegible]	SHELL JUMPS MAG.	FOLLOWER BINDS	LOADING	BOLT OVERRIDE	ACTION HANG UP	DON'T [illegible]	[illegible]	[illegible]	[illegible]	FF Ammo		
R35R1	DT	100																										
R35R1	DT	100																										
R35R1	DT	100																										
R35R1	DT/FS	100																										
R35R1	FS	100																										
R35R1	FS	100																								1		
R35R1	FS	100																										
R35R1	DT	100																										
R35R1 5/9	DT	100																										
R35R1 ↓	DT	100																										
TOTAL (PER MAL.)																												

METHOD NO.: ______ PAGE NO. 5

DATE: ______ MODEL: XP100 CALIBER: 35 Rem SERIAL NO. B7513713

PREVIOUS ROUNDS ______

TEST TITLE: ______

TTL. RDS. FIRED: ______
TTL. MALFUNCTIONS: ______
MALFUNCTION RATE: ______

Stock #5

"MALFUNCTIONS"

	SHOOTER	NO. OF ROUNDS FIRED	[illegible]	[illegible]	DON'T [illegible]	DON'T [illegible]	DON'T LOCK OPEN	FEED FROM MAG. 1st	LATCH 2nd	SHELL STEMS MAG.	POWER OVERRIDE	DON'T LOCK UP	STEM CHAMBER [illegible]	STEM CHAMBER [illegible]	STEM CHAMBER [illegible]	STEM CHAMBER [illegible]	SHELL JUMPS MAG.	FOLLOWER BINDS	LOADING	BOLT OVERRIDE	ACTION HANG UP	DON'T [illegible]	[illegible]	[illegible]	[illegible]			
R35R1	DT	100																										
R35R1	DT	100																										
R35R1	DT	100																										
R35R1	DT	100																										
R35R1	DT	100																										
1500 rds on stock #5 split at front tube [illegible]																												
R35R2	DT	100																										
R35R2	DT	100																										
R35R2	DT	100																										
R35R2	DT	100																										
R35R2	DT	100																										
TOTAL (PER MAL.)																												

2000 rds on stock #5 no change from 1500 rds

PAGE NO. 4

DATE: 9/9/86 MODEL: XP100 CALIBER 35 Rem SERIAL NO. B7513713

PREVIOUS ROUNDS ______

TEST TITLE. ______

TTL. RDS. FIRED: ______
TTL. MALFUNCTIONS: ______
MALFUNCTION RATE: ______

Stock #6

"MALFUNCTIONS"

	SHOOTER	NO. OF ROUNDS FIRED	FIRING	[illegible]	DON'T EJECT	DON'T BLOW BACK	DON'T LOCK OPEN	FEED FROM MAG. 1st	FEED FROM MAG. 2nd LATCH	SHELL STEMS MAG.	POWER OVERRIDE	DON'T LOCK UP	STEM CHAMBER [illegible]	STEM CHAMBER [illegible]	STEM CHAMBER [illegible]	STEM CHAMBER [illegible]	SHELL JUMPS MAG.	FOLLOWER BINDS	LOADING	BOLT OVERRIDE	ACTION BANG UP	DON'T IMPACT	[illegible]	[illegible]	[illegible]
R35 R1	DT	100																							
R35 R1	DT	100																							
R35 R1	DT	100																							
R35 R1	DT	100																							
R35 R1	DT	100																							
1500 rds on stock – split at front take down screw approx ½" long in same																									
R35 R1	DT	100																							
R35 R1	DT	100																							
R35 R1	DT	100																							
R35 R1	DT	100																							
R35 R1	DT	100																							
2																									
TOTAL (PER MAL.)																									

2000 rds on stock – split same

Bill Coleman - VWB
For your information. Please return.
Jim

September 12, 1986

TO: E.O. FINI

FROM: W.H. FORSON, JR.

SUBJ: STATUS - XM-24 SNIPER WEAPONS SYSTEM (SWS)

John Rogers, Terry Douglas, our military consultant, and I attended the pre-solicitation Conference on the Sniper Weapons System September 8, at Picatinny Arsenal in Dover, New Jersey. The purpose of this letter is to advise you of the outcome of the conference and familarize you with this potential contract.

Background

The U.S. Army has determined a need for a Sniper Weapons System (SWS) and has asked for proposals from various arms manufacturers. The SWS is considered to be a Non Developmental Item (NDI) which means they do not intend to fund any R & D effort in the development of this system.

Rather they are relying on manufacturers to propose an SWS for consideration. It is understood that the system offered will probably consist of "off the shelf" components as there is little time to enable much in the way of product development. Their purpose is to shorten the time normally required from the determination of need to implementation with combat forces. A further stipulation is that the successful contractor will be expected to handle all support and service for the intended life of the system which is ten years.

Currently the U.S. Army is using accurized version of the autoloading M-14 for sniper work. They have decided this rifle does not perform adequately at the ranges encountered for sniper applications. Accordingly they are interested in a rifle/scope combination in 7.62mm that is effective to 800 meters. They are looking for a true system approach expecting the successful contractor to supply the rifle, scope, precision target style iron sights, and all accessories including tools, cleaning equipment, and carrying case.

Work Completed to Date

We were aware of this upcoming need in March 1986. At that time there was little in the way of specifications

available from the Army and we realize we had virtually no expertise in this specialized area. To learn as much as possible and get a headstart in this program, we located an expert military consultant, Bruce Wincentsen a retired Marine with 30 years service and extensive experience with the USMC sniper rifle program.

Wincentsen arranged for several of our Ilion R & D people to tour the Marine facility at Quantico, VA to gain familiarization with their sniper program. The Marine Corps has used our basic Model 700 action altered by their armorers for approximately 20 years. For this reason we feel the Model 700 has established a high degree of credibility which should be favorable to us when the Army evaluates various rifles.

Based on Wincentsen's recommendations R & D has produced and fired three prototype rifles. It should be pointed out that we were proceeding on our own as we did not have anything in the way of specific product requirements until August. At the September 8 conference at Picatinny Arsenal we determined that our prototype design is on the right track.

Pre-Solicitation Conference

The Army's intent with the Pre-solicitation Conference was to answer questions from all potential contractors to enable them to issue the RFP (Request for Proposal) by October 1. We sent in a series of questions prior to the conference. Upon arrival the Army provided written answers to all questions from vendors.

During the conference the government representative went through the tentative product performance requirements noting any significant changes since August. They invited additional written questions during the conference which they answered prior to adjournment. They said the input from the vendors will be taken into consideration when the product requirements are finalized in the RFP.

Our collective impression from the conference is that the government will not provide much in the way of design criteria. Instead they will specify performance standards and it will be up to the individual vendors to determine the best way to meet those needs. The government said they were taking this approach to challenge manufacturers and have the opportunity to test a variety of potential solutions to the SWS.

We also got the impression that most vendors were not at all pleased with the government's NDI approach to the SWS. They are evidently used to having the government provide

exact design requirements for new programs. This was evidenced by the type of questions asked and a noticeable frustration with the answers received. As an example it was asked if stainless steel barrels and synthetic stocks were preferred. The response was that the government had no preference in either area. This was their typical answer.

The conference did establish the timetable and events that will be included in the final determination of award. Significant points follow:

- RFP (Request for Proposal) is tentatively scheduled for release October 1, 1986.

- Formal response is expected 45 days from RFP. The response consists of 10 complete SWS systems, i.e. rifle, scope, and accessories. Also required are copies of operations manuals for the system offered and a parts list detailing parts required to support the SWS over its entire service life.

- Bid samples will be tested at the U.S. Army Aberdeen Proving Ground to ascertain whether products meet the performance criteria. The testing procedure is rather involved and won't be detailed here. Products will be evaluated on the basis of ruggedness, probability of hit (accuracy) and weight.

- Price will not be the final determinant. In other words the government intends to select the best product and price will be used only to break a tie if more than one offering meet all requirements and are essentially equal.

- Award of contract is expected by April, 1987.

- First article test should be about May 15, 1987.

- First unit equipped - 30 rifles to go into service in August, 1987.

- Total quantity - 528 in FY'87, 237 FY'88, 551 FY'89, and 507 FY'90, Total 1,823.

Recommendation

After attending the Pre-Solicitation Conference, we believe we are in relatively good shape versus our competition. The prototype rifles produced appear to be in accordance with most of the government's requirements. The primary obstacle at this point is timing. Assuming the RFP is released October 1, 1986, we will have to assemble 10 complete Sniper Rifle Systems for submission to the Army by

November 15, 1986. As previously mentioned, this includes all accessory items plus operators manual and repair parts list. We are expected to have our total package price ready at this time.

There are several reasons why we believe it is in our best interest to pursue this contract including:

- Earnings potential - The SWS system will be high priced, possibly as much as $2,000 each which equates to net sales of $3,646,000.

- Future business - We need to establish ourselves as a viable government contractor. This contract could do much to eliminate the negative feeling on the part of the government from our withdrawal from the SAWS project and the M-16-A2 program in 1984. It could lead to increased government business. In addition to the U.S. Army, there is a definite possibility the SWS could be adopted by other military services and there are also civilian law enforcement applications.

- Competitive advantage - Several foreign manufacturers are actively going after this contract to support their recently built U.S. factories. It certainly is in our best long term interest from both a government sales and commercial domestic sales viewpoint to keep

these manufacturers out of our markets.

Our recommended strategy is to make up the required samples to be available for submission on November 15. We should price the package to provide acceptable profit margins and be able to document all components of cost for possible use at contract negotiations. If our product comes out first in the Army's testing program, price should not be a major issue. If we are not successful, I believe the experience will be worthwhile as it has already given us a clearer insight into government business and we expect to benefit from our participation.

WHF/nm

pc: L.E. Zeillmann
H.K. Boyle
J.W. Bower
D.J. Anderson
J.D Rogers

Remington®

DUPONT

REMINGTON ARMS COMPANY, INC.

SPORTING ARMS-AMMUNITION-TARGETS-TRAPS

ILION, NEW YORK 13357

TELEPHONE (315) 894-9961

September 12, 1986

Department of the Army
U.S. Army AMCCOM
Dover, NJ 07801-5001
Attn: AMSMC-PCW-C (D)
Harry Santa, Bldg. 10

Subject: Sniper Rifle Weapon System, M24

Dear Mr. Santa:

After review of the purchase description dated September 3, 1986, a number of questions and comments have surfaced. They are as follows:

3.3.1 Component carrying case. Deployment kit. What is contained in this kit, replacement parts & special tools?

3.14.3 Maintainability. Replacement of firing pin and extractor. Would tools be included in deployment kit to accomplish replacement? We feel an additional bolt assembly, headed to each particular weapon would provide a faster and easier replacement than a separate firing pin and extractor. Is this option acceptable?

3.14.15 Iron sights. Peep aperature of 5.5 to 5.9MM. Would an adjustable aperature, (Merit Style) be acceptable if the 5.5 to 5.9MM range is included?

3.14.17 Safety. Force of 2 to 6 pounds to operate. Would it be acceptable to exceed 6 pounds?

3.15.2 Trigger pull. Externally adjusted in movement after release (MAR). This adjustment is not possible externally with our fire control and we question the merit of this specification. MAR is set at the factory and can be changed only by weapon disassembly. If this specification is required, this may preclude our quoting on the SWS.

We await your reply.

Sincerely,

J.D. Rogers
Marketing Specialist
Government & Law Enforcement
Product Service Department

JDR/tpp
encl.

Bill Calfee Rifle Machine, Inc.

Route 3 Borden, Indiana 47106

Phone 812-967-2413

9-13-86

Remington Arms Co, Inc.
Ilion, New York 13357

Mr. Terry Douglas:

Terry:

I just completed XP100 22 Rim fire conversion number 15 and tested it today at the range before delivery to my customer. I fired 15 five shot groups at 50 yards using three different brands and four different types of 22 rim fire ammo. I shot three groups with Eley sub-sonic hollowpoint, three groups with Eley standard also four groups with CCI mini-group lot #20 and five groups with Lapua match.
The fifteen groups agged .377" The five groups with the Lapua match agged .284"
I was shooting from bench rest with a 20 Lyman scope on the pistol. To this conversion I fitted a Douglas #2 SS barrel 16 twist. Headspace set @ .041" with the chamber engraving both bands of the bullet. Barrel legnth is 15".

Point is, these conversions shoot as good or better than your 40-X target rim fire rifles or any one elses for that matter.
I have orders for two more conversions and have only three more used 40-X rimfire bolts to work with.
Terry, could you see if the parts dept would sell me 5 40-X rimfire ejectors (loading ramp and ejector from 40-X rimfire) and also about 10 bolt stops from the mod. 600 rifle in cal 308. I need these parts. I could use some 40-X rimgire Bolts also.(well I must keep asking).

Without question, these XP100 rimfire conversions are the most prized guns in silhouette shooting today. You are missing an oportunity if your company doesn't make them.

Please have parts shipped COD if you can get them.
Thanks, Bill

"Defend Your Right To Keep And Bear Arms"

Title - Monthly Reports ①

TO: J. W. BOWER 9/15/86

FROM: T. C. DOUGLAS

SUBJ: QUARTERLY REPORT - SEPTEMBER 1986

MODEL 11-87

The test lab is currently running a 4000 rd endurance test of 30 guns with the new grip cap. Most of the guns are currently at less than 1000 rds with no grip cap joint failures.

MODEL 1100 - 20, 28, AND 410 GUAGES

A twelve gun test has been designed to test the addition of a stainless steel magazine tube to the 20-20. This test will also include orifice changes in the magnum gun for enhanced performance of the 2¾" magnum lead and steel loads. The 20 GA. Special Field detent system will also be tested as a cost reduction item. The test has been delayed since mid-July due to waiting for Production to supply 20 gauge choke tube barrels for Trial + Pilot in conjunction with this test. This test is currently scheduled to start the week of Sept 29th.

If the stainless steel magazine tube and detent system tests successfully in the 20-20 magnum, it will be implemented in the 28 and 410 guages without testing.

MODEL 870 FUNCTIONAL IMPROVEMENTS

Research work is complete pending Production Trial + Pilot.

MODEL 700 - .338 WIN MAG

Research work is complete pending Production Trial + Pilot

12 GAUGE SLUG GUN DEVELOPMENT

Testing of rifled choke tubes (fabricated from rifled-barrel sections) has given positive indications that a choke tube can stabilize a shotgun slug. Testing is underway to determine the length of rifling, bore and groove dimensions, and twist. The model shop is setting up to cut rifle current Remington choke tubes. Initial testing using carbon steel barrel sections converted to choke tubes show signs of bulging which we feel can be overcome with the stainless steel tubes or a longer choke tube which would have the rifled section not within the barrel section.

XP-100 in 35 REM

Design acceptance testing is currently underway. Six stocks have been endurance tested through 1000 rds and two of them were shot 2000 rds. All six stocks were 100% serviceable. Several stocks did show minor internal glue joint failures, but present no safety or function problems to the shooter.

Pending the final Test Lab Report, it is anticipated that this design will be transmitted by Oct 1, 1986 to Production.

SNIPER WEAPON SYSTEM (M24 SWS)

Accuracy tests on the four candidate barrel types at 100 yds do not show a clear winner. A few of the barrel types will be reshot with M118 Lake City Match due to a suspected "lot" variance and all of the barrel candidates will be shot from 300 yds to determine the most accurate barrel for the rifle.

Jerry Douglas, John Rodgers, Bill Forson, and Bruce Wincentsen attended a bidders meeting September 8th in Dover, New Jersey. Revised specifications were issued and technical questions were addressed. It is anticipated that the Request For Proposal (RFP) will be issued on Oct 1, 1980 with bidders to respond by Nov 15, 1980. Economics are being developed to determine whether or not to continue with this program.

VV

Report No. 862681

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

	AREA OF TESTING	
Y Developmental	____ Safety Related	____ Litigation
Y Design Acceptance	____ Competitive Evaluation	____ Warehouse Audit
____ Pre-Pilot	X New Design	____ Cost Reduction
____ Pilot	____ Design Change	Stake TEST FIXTURE(S)
____ Production Acceptance	____ Plant Assistance	____ Other

FIREARM STAT'S.

MODEL: XP 100
CAL or GAGE: 35 REM
BARREL TYPE: ____
PROOFED: YES ____ NO ____

REPORT REQ'D.

FORMAL ____
TEST RESULTS ONLY X

DATE REQUESTED: SEPT. 25 '86
DATE NEEDED BY: ASAP
REQUESTED BY: A. A. HUGICK
WORK ORDER NO: C0801-307-Y

TEST TYPE

X Strength Test	____ Ammunition Test	____ Dry Cycle Test	____ Photo/Video
X Function Test	____ Environmental Test	____ Measurements	____ Other ____
____ Accuracy Test	____ Customer Complaint	____ Endurance Test	____

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

FABRICATE A "SECOND" SHOOTING REST FOR XP-100 WHICH WILL ALLOW GREATER XP100 MOTION DUE TO RECOIL WHEN COMPARED TO CURRENT XP100 FIXTURE.

CONSIDERATION(S): ACTION MOTION NOT TO BE LIMITED BY RIGID MEMBER(S), MAJOR PISTOL SECURING IS TO BE NON-RIGID & ASSOCIATED WITH STOCK GRIP AREA, PISTOL TO BE FIRED WITH LANYARD AND →

GUNS REQUIRED:

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: 9-30-86
TEST COMPLETED BY: R. W. HOWE
REPORT DATE: X

RD-66-B

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DUPONT PETERS DUPONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

CC: W. H. Coleman, II
H. K. Boyle
D. J. Anderson
T. C. Douglas
J. D. Rogers

ILION, NEW YORK
SEPTEMBER 26, 1986

TO: K. W. SOUCY

FROM: J. W. BOWER

M24 SNIPER WEAPON SYSTEM

Several months ago, the Firearms Business Team authorized the hiring of Bruce Wincentsen, an ex-Marine Corp. officer, as a consultant on a potential contract with the Army for sniper rifles. Research has been working with Wincentsen, and the specifications for the rifle are beginning to take shape:

- Model 700 receiver.
- Modified Model 700 Fire Control.
- Leupold daylight scope.
- Sourced stainless steel barrel.
- Sourced synthetic stock.

The Army's Request for Proposal (RFP) is due to be released on October 1, with our response due back to them by November 15. The response consists of the price of the rifle over its' service life (life-time maintenance), ten complete rifle systems (rifle, scope, and accessories), a copy of the owner's manual, and a parts list. Research will take care of most of the items, but we will need help from you on determining the rifle's price.

The contract is expected to be awarded by April, 1987, with First Article Testing around the middle of May. If awarded the contract, and the current schedule doesn't change, the Plant will need to ship the first 30 rifles in August, 1987. The total quantity is expected to be 1,800 rifles spread over a four year period, so expect that production will have to build about 500 rifles a year. Will the Plant have the resources to accommodate?

The stake appears worthwhile. A very preliminary look at selling price puts the rifle in the $2,000 to $2,500 range. Assuming a 10% ATOI, the potential earnings to Remington may be $360M to $450M.

JWB:bjr

Report No. 862741

RESEARCH TEST & MEASUREMENT LAB WORK REQUEST

	AREA OF TESTING		
___ Developmental	___ Safety Related	___ Litigation	
✓ Design Acceptance	✓ Competitive Evaluation	___ Warehouse Audit	
___ Pre-Pilot	___ New Design	___ Cost Reduction	
___ Pilot	___ Design Change	Stake LOT	
___ Production Acceptance	___ Plant Assistance	___ Other	

FIREARM STAT'S.	REPORT REQ'D.	
MODEL: 700	FORMAL ___	DATE REQUESTED: 10-1-86
CAL or GAGE: 30-06	TEST RESULTS ONLY ✓	DATE NEEDED BY: 10-17-86
BARREL TYPE: BDL		REQUESTED BY: F. H. SMITH
PROOFED: YES ___ NO ✓		WORK ORDER NO: C-0605-310

TEST TYPE

✓ Strength Test	___ Ammunition Test	___ Dry Cycle Test	___ Photo/Video
___ Function Test	✓ Environmental Test	___ Measurements	___ Other ___
✓ Accuracy Test	___ Customer Complaint	___ Endurance Test	___

EXPLAIN IN DETAIL THE REASON FOR THIS TEST:

ACCURACY: • USING SAME 30-06 BBL. ACTION SHOOT 3 5-SHOT GROUPS WITH BOTH STOCKS (~~SAME~~

ENVIR.: • FREEZE EACH STOCK W/ACTION OVERNIGHT AT -40°F & RESHOOT ACCURACY (SAME ACTION BOTH STOCKS)
• HEAT EACH STOCK W/ACTION OVERNIGHT AT 250°F & RESHOOT ACCURACY (SAME ACTION BOTH STOCKS)

STRENGTH: • USING ADDITIONAL ACTIONS DO STD. DROP TEST ON STOCKS

NOTE – CHECK STOCKS FOR BREAKAGES AFTER FREEZE & DROP TESTING.

GUNS REQUIRED: – 2 – FIBERGLASS STOCKS, 'BDL' FOR ACCURACY
– 1 – 30/06 BBL ACTION 'BDL' FOR ACCURACY
– 2 – ADDITIONAL 'BDL' BBL. ACTIONS FOR DROP TESTING

NOTE: NO firearms or parts will be tested in the Labs unless they are accompanied by a Work Request, and both are delivered to the Labs by the designer or engineer. All Work Requests are to be filled out in detail. No Exceptions.

DATE COMPLETED: 12-3-86
TEST COMPLETED BY: JS/JH
REPORT DATE: 12-4-86

10/02/86

SWS ASSIGNMENTS

TERRY DOUGLAS:

1. Review test plan and devise timing.
2. Review RFP for changes and modify schedule and scope of work.
3. Work with Shumway on contractor logistic support.
4. Scope of testing for new Fire Control w/Bower and Snedeker.
5. Which contractor does testing - get cost estimates (group decision).
6. Who performs what maintenance - get cost estimates (group decision).
7. Write and monitor test lab testing.

DAN SHUMWAY:

1. Unit cost of SWS.
2. Estimate costs of FAT (First Article Testing).
3. Estimate lot acceptance testing.
4. Estimate pricing for rifles and Options I, II, and III.
5. Estimate costs for Technical Data Package.
6. Unit price for modification to .300 Win. Magnum.
7. Develop costs for contractor logistical support.
8. Costs of new equipment training course.

FRED MARTIN:

1. Write operator's manual (w/Bruce) (Smithson for type).
2. Write maintenance/repair manual (w/Bruce) (Smithson for type).
3. Determine spare parts kit (to Shumway for estimating).
4. Write technical proposal for conversion to .300 Win. Magnum (to Shumway for estimates).
5. Provide new equipment training video w/Fred Supry.
6. Selection of Iron Sight System (w/Douglas - costs to Shumway).
7. Finalize fire control design.

JIM SNEDEKER:

1. Estimate FAT (to Shumway for costs).
2. Estimate Lot Acceptance Testing (to Shumway for costs) (lot sizes?).
3. Provide test report documenting safety testing including proof firing.
4. Fred Supry w/Fred Martin to provide new equipment training video.
5. What test facilities and equipment do we need.

ED OWENS/JOHN ROGERS:

1. Vendor cost estimates -
   a) Day optical scope, rings, bases and scope case - Leupold
   b) Stock
   c) Barrel
   d) Trigger guard - Grisel
   e) Sling swivels - Michaels
   f) Carrying case
   g) Iron sights
   h) Cleaning kit and special tools - order (w/Douglas/Martin)
   i) Vendor coating
2. Design accuracy device.
3. Design rain chamber.

BRUCE WINCENTSEN:

1. Write operator's manual (w/Martin).
2. Write maintenance/repair manual (w/Martin).

RON SMITHSON:

1. Estimate cost of operator's manuals (to Shumway for costs).
2. Estimate cost of maintenance/repair manuals (to Shumway for costs).
3. Typing of manuals for sample submission (10 operator & 1 maintenance/repair).
4. Estimate cost for Technical Data Package (to Shumway).

TCD:cap

DESIGN TEST

XP100 - 35 REM. CALIBER SN B7513713

ADDED ENDURANCE SHOOTING

10-6-86 - A. A. HUGICK

A SECOND SOFT PISTOL XP100 PISTOL SHOOTING REST WAS FABRICATED IN THE MEM/TEST LAB (R. Howe) FOR ADDITIONAL XP100 STOCK ENDURANCE SHOOTING. THIS SECOND RECOIL REST (PICTURE ATTACHED) HOLDS THE XP100 STOCK GRIP WITH PACKING FOAM/NEOPRENE SUCH THAT THE REST BETTER ATTEMPTS TO ELIMINATE HAND HOLDING OF THE GRIP WHILE SHOOTING OF THE PISTOL. NO SUPPORT OR CONTAINMENT CONTACTED THE BARREL/RECEIVER ASSEMBLY SUCH AS TO ALLOW FREE UNRESTRICTED TRAVEL OF THE ASSEMBLY IF TOTAL STOCK HALF SEPERATION WERE TO OCCUR. DURING SHOOTING INSPECTIONS LITTLE IF ANY INCREASED STOCK JOINT SEPERATION WAS NOTED AFTER SHOOTING THE ADDITIONAL 1000 ROUNDS OF FACTORY R-P ET FLASH AMMO. OR FIRING TWENTY ROUNDS OF R-P PROOF AMMO. THE TOTAL ENDURANCE ROUNDS FIRED ON THIS STOCK IS 3000 ROUNDS OF FACTORY AMMUNITION + TWENTY ROUNDS OF PROOF.

AAH.

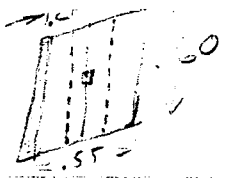
WHEN FIRING TESTS ARE COMPLETED THE STOCK SHOULD BE SECTIONED AND JOINT QUALITY BE INSPECTED. OBSERVATION OF THE JOINT WELD MAY INDICATE FUSION OF JOINT IF MATERIAL HAS A TORN APART APPEARANCE OR MAY INDICATE TACKED JOINT IF STOCK JOINT APPEARANCE IS THAT AS MOLDED. DESIRED IS THAT OF FUSED JOINT.

FOUR DESIGN / PROCESS CHANGE CONSIDERATIONS THAT MAY BE CONSIDERED FOR IMPROVING QUALITY/STRENGTH OF ALL XP-100 STOCK JOINTS ARE AS FOLLOWS:

1. JUDGE APPLICATION OF PHENOWELD SOLVENT IN THE STOCK JOINT AREA IMMEDIATE WITH JOINT SEPERATION LOCATED FRONTWARD AND REARWARD OF FRONT ASSEMBLY SCR.

2. STOCK MOLD CLAMP FIXTURE SHIMMING SUCH AS TO INSURE CONTACT OF STOCK HALVES IN THE AREA IMMEDIATE WITH JOINT SEPERATION.

3. STOCK MOLD(S) ALTERATION OF THE KNOCK OUT PUNCH LENGTH AND SHAPE SUCH AS TO INTRODUCE A PROJECTION & CAVITY FOR GAGGING THE STOCK JOINT FORWARD OR THE FRONT ASSEMBLY SCREW LOCATION. LENGTH CHANGE CONSIDERATION ± 0.C INCHES.



4. STOCK MOLD(S) ALTERATION SUCH AS TO PROVIDE INCREASED JOINT CONTACT AREA IMMEDIATELY REARWARD OF THE TRIGGER GUARD LOCATION. APPROXIMATE .6 in HEIGHT X .2 WIDE = .12 IN^2 PER STOCK HALF INCREASED JOINT BOND AREA IMMEDIATE TO JOINT OPERATION LOCATED ADJACENT TO THE FRONT STOCK ASSEMBLY SCREW.

B7513713

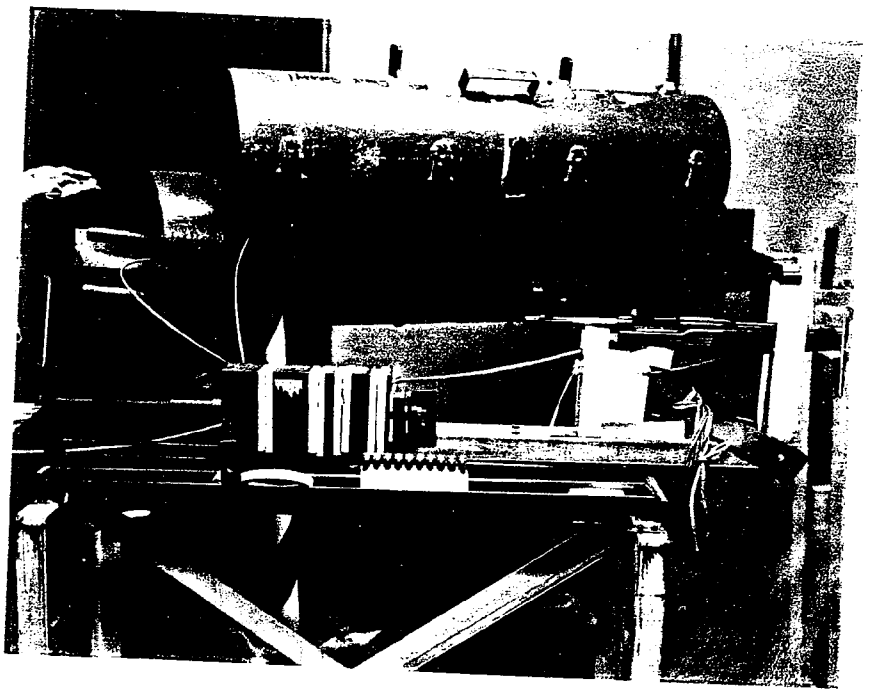
R35R1 — 150 } AS TAKEN OUT OF
R35 [illegible]

10-1-86

150

200 10-2-86 TIED GAP DOWN W/ ADJUSTMENT PART
150 CROSS SCREW — LOOKS GOOD

150
200
200
200
200
150
ROXED 10 150
200
200
150
200
150
200
150
200
20 200
150
200
150
200
2 150 — 50



FROM SUPPLY / BOB HOUSE

10-2-86 INSPECTION, RE-SCREENED, START 500 MORE

1 150
200
150
200 CHECK'D SCREW TIGHTNESS
150
200
150 CHECK'D SCREW TIGHTNESS
200
150
10 200
150
200
150
200
200
16 150 — GOT AVAILABLE
150
150
150
150
150 — CHECKED SCREW TIGHTNESS
150
150
150
25 150 (1000 FIRED ROUND) ~~ADD~~ TOTAL = 3000 ON STOCK
PROOF → 200
B05R

DONE — FINISH'D 10-3-86,

RD 5707
Rev. 2/77

DATE 10/9/86

REMINGTON ARMS COMPANY, INC. A. A. HUGICK

COMPANY PROPERTY RECEIPT

Product and other property taken off the Plant for business purposes (on a no charge basis - not covered by Purchase Order or Shipping Order.)

This will acknowledge receipt of the following property:

QUANTITY	MODEL NO.	GUN SERIAL NO.	DESCRIPTION
1	XP-100	B7513899	REM. 35 PISTOL
			PLUS: 2-1/2X REDFIELD SCOPE
			AND CARRYING CASE

AMENDED PISTOL PERMIT COPIED ON BACK 10/13/86 A. A. HUGICK

Control Center: R & D
~~R X E X & X C~~

It will be delivered to A. A. HUGICK RESIDENCE AT: R. D. #2, NORTH CREEK ROAD, LITTLE FALLS, N.Y.

For the purpose of FIELD TEST

And is to be returned by approximately DECEMBER 10, 1986

Received Adam A. Hugick
(Individual taking the property)

Approved [signature]
D. JOHNSON

Checked out by _____
Foreman-Shipping or Warehouse
or Reception Room Guard

Return of Local Field Test Guns
Above property returned on _____

Signed _____
Foreman-Shipping or Warehouse
Dept. or Reception Room Guard

June 6 '86

WORK ORDER C0801-307-Y

XP100 - ADDITIONAL CALIBERS (35 REM).

(*) (12) TWELVE. BARRELED ACTIONS

ADAM HUGICK (461)

* WILL BE OUT OF PLANT JUNE 9 → 13, 86

(*) HAVE BEEN DRAW FILED TO REMOVE MOST OF BARREL CHATTER MARKS WHICH OCCURRED @ TURN OR PROFILE.

12 MORE TURN'D (2 PASSES) A.
AND DELIVERED TO CUSTOM SHOP 6/11/86

RD 5707
Rev. 2/77

DATE 10/9/86

REMINGTON ARMS COMPANY, INC. A. A. HUGICK

COMPANY PROPERTY RECEIPT

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This will acknowledge receipt of the following property:

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1	XP-100	B7513899	REM. 35 PISTOL
			PLUS: 2-1/2X REDFIELD SCOPE
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AMENDED PISTOL PERMIT COPIED ON BACK 10/10/86 A. A. HUGICK

Control Center: R & D

It will be delivered to A. A. HUGICK RESIDENCE AT: R. D. #2, NORTH CREEK ROAD, LITTLE FALLS, N.Y.

For the purpose of FIELD TEST

And is to be returned by approximately DECEMBER 10, 1986

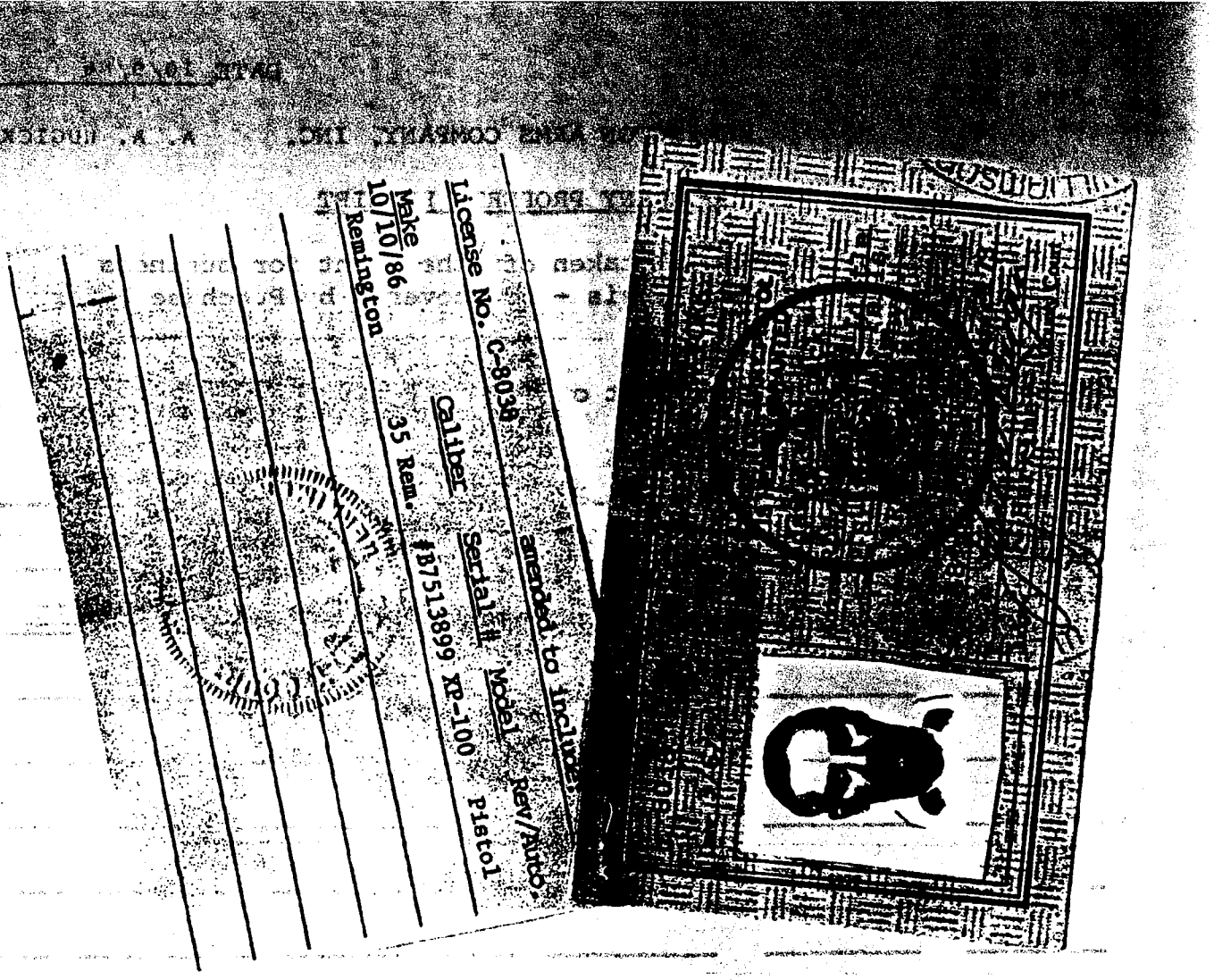
Received Adam A. Hugick (Individual taking the property)

Approved D. JOHNSON

Checked out by _____
Foreman-Shipping or Warehouse or Reception Room Guard

Return of Local Field Test Guns
Above property returned on _____

Signed _____
Foreman-Shipping or Warehouse Dept. or Reception Room Guard


License No. C-8038 amended to include:
Make 10/10/86
Remington
Caliber
.35 Rem.
Serial# Model
B7513899 XP-100 Pistol
Rev/Auto

xc: J.W. Bower
W.H. Forson

October 10, 1986

SWS ASSIGNMENTS
(Revised)

JOHN ROGERS:

1. Remington liaison to Army Contracting Officer.
2. Review RFP and coordinate plant personnel input necessary to meet RFP submission requirements.
3. Write RFP submission.
4. Sub-contractor contract negotiations (cost info to Shumway).
5. Obtain necessary military specifications.

TERRY DOUGLAS:

1. Review RFP for specification changes and coordinate R&D selection efforts.
2. Review test plan and revise, if necessary.
3. Write and monitor test lab testing.
4. Assist John Rogers (RFP response).
5. Assist Dan Shumway (economics).
6. Write parts list (w/Smithson).

DAN SHUMWAY:

1. Unit cost of SWS.
2. Estimate costs of FAT (First Article Testing).
3. Estimate lot acceptance testing.
4. Estimate pricing for rifles and Options I, II, and III.
5. Estimate costs for Technical Data Package.
6. Unit price for modification to .300 Win. Magnum.
7. Develop costs for contractor logistical support.
8. Costs of new equipment training course.

FRED MARTIN:

1. Finalize fire control design.
2. Selection of Iron Sight System (w/Douglas - costs to Shumway).
3. Define Deployment Kit (to Owens for special tools - to Shumway for estimating).
4. Write technical proposal for conversion to .300 Win. Magnum (to Shumway for estimates).
5. Write operator's manual (w/Bruce - Smithson for type).
6. Write maintenance/repair manual (w/Bruce - Smithson for type).
7. Provide new equipment training video w/Fred Supry.

JIM SNEDEKER:

1. Estimate FAT (to Shumway for costs).
2. Estimate Lot Acceptance Testing (to Shumway for costs - lot sizes?).
3. Provide test report documenting safety testing including proof firing.
4. Fred Supry w/Fred Martin to provide new equipment training video.
5. What test facilities and equipment do we need.

ED OWENS:

1. Obtain samples for test and order submission quantities of:
   a) Stock (15 each - w/Martin)
   b) Grisel trigger guards (15 each)
   c) SWS Case (17 each - w/Douglas)
   d) Day optical scope, rings, bases, screws, sunshade, lens covers, scope cleaning kit and scope carrying case (15 each) Leupold
   e) Iron sight system (15 each - w/Martin)
   f) Cleaning kit items (15 each - w/Martin)
   g) Special tools (15 sets - w/Martin)
   h) Sling swivels (20 sets - w/Douglas)
   i) Bipod
2. Provide data on selected items to Rogers for sub-contractor negotiations.
3. Design test equipment as required to meet contractual obligations (per Snedeker/Rogers).
4. Research action finish operations available.

BRUCE WINCENTSEN:

1. Write operator's manual (w/Martin).
2. Write maintenance/repair manual (w/Martin).
3. Assist with RFP submission requirements (w/Rogers).

RON SMITHSON:

1. Estimate cost of operator's manuals (to Shumway for costs).
2. Estimate cost of maintenance/repair manuals (to Shumway for costs).
3. Typing of manuals for sample submission (10 operator & 1 maintenance/repair).
4. Estimate cost for Technical Data Package (to Shumway).
5. Write parts list (w/Douglas).

TCD:cap

bcc: Terry Douglas

Remington

DUPONT

REMINGTON ARMS COMPANY, INC.

SPORTING ARMS-AMMUNITION-TARGETS-TRAPS

ILION, NEW YORK 13357

TELEPHONE (315) 894-9961

October 16, 1986

Congressman David O'B. Martin
U.S. House of Representatives
Washington, DC 20515

Dear Congressman Martin:

I would like to take this opportunity to inform you of a significant proposal that we will be submitting to the U.S. Army. This proposal is for the Sniper Weapon System (SWS) M24, a U.S. Army non-developmental item (NDI). The complete M24 SWS will consist of the following:

- Rifle
- Day optical sight
- Back-up iron sights
- Carrying case for the sighting system
- Cleaning equipment
- Operator's manual
- System component carrying case
- Operator's deployment kit

Their current requirement is for 2,000 systems, including maintenance support, over the next four years. It is also our belief that the other armed services may adapt this system for their use. The NDI feature would also avail it to the law enforcement market.

We know we can offer a high-quality product and of great importance, made entirely in the U.S.A. Any comments or suggestions you may have in our endeavorwould be appreciated.

Sincerely,

J. D. Rogers
Marketing Specialist

JDR/cal

XC: W. H. COLEMAN

TO: Jim Bowen
FROM: Terry Douglas

10/28/86

SUBJ: M24 Sniper Weapon System (SWS)

I met with John Rodgers at 8:15 AM this morning and John & I talked about the RFP. John indicated that he wasn't familiar with all of the requirements. I strongly suggested we have a meeting today to go over Section L (Submission instructions/requirements).

A meeting was held at 12:30 with John, myself, Ed Owens, Jerry Hill, Lou Ferriera, Dan Shumway, & Jim Snedeker. We covered Section L and I explained to John that he needed to contact our vendors for needed data, make assignments to get the data necessary to answer the RFP (Non-research personnel primarily), & find out who he needs to get signatures from in Wilmington. I impressed on him that we are down to basically ≈ 2 WKS. I think John has finally realized what a task we have ahead of us. I think it will take a super-human effort to meet the existing deadline; Frankly I don't think we can make it.

Terry C. Douglas

I Dave Can
thought you might
like to read this
Fred

208 Spruce Road
Brunswick, Georgia 31520
10,24,86

Fred Emhof
Remington Arms Company
P.O. Box 179
Ilion, New York 13357

Dear Fred,

I am aware of the decision to enter a rifle into the Sniper Trials to be conducted shortly. In light of this I wish to outline a problem I'm sure you are aware of which is the extractor failure on the Model 700 type rifles. Since your system will be undergoing adverse condition testing at Aberdeen, I feel that this system will excel in all areas except extraction. Since the requirements are geared to first and second level user maintenance, the failure of an extractor will be scored very hard against your system if it cannot be replaced by first/second level people.

I am aware of a decision to issue an extra bolt assembly with the system however I feel from a public relations standpoint, this could go against you in that the user is going to be told he has to carry a complete bolt as a spare in case his main one goes down.

Being a former Test Director at Aberdeen Proving Ground, I am very aware of the adverse condition testing such weapons are exposed to and as such I feel that the extractor as fielded (both the original and the new claw type) will not exhibit the desired performance needed to get through such.

I am sure you are aware of the Sako extractor change that your customers are having done in the field rather than send their guns back to you for repair, i.e. the installation of the Sako extractor on your bolts. It is my understanding that such cost 75.00 per conversion which tells me (as an evaluator) two things: 1 the public has no confidence in your extractor system, and 2 there is nothing inherently wrong with the rest of your system. I can agree with this estimation as your barrel accuracy from my exposure has always demonstrated good results in the bolt series and the triggers can get adjusted to please about anyone. The human engineering on the rifle is also good, however as pointed out above, the extractor is the major shortcoming of this system. I have observed about six a year failing on the line in my matches.

I would sincerely recommend to you to improve this extractor system before you go into this series of tests and this will be cleared up. If you don't improve the extraction, I feel it will be your biggest problem. I would recommend the extractor on the Winchester Model 70 (late type). This is not a Winchester patent and was patented by Paul Mauser per the information received while I was with the Army Small Caliber Laboratory. This is why we used this particular type on the Dover Devel 20 MM modification. This extractor system was patented by Mauser around the turn of the century so you should be able to use it. I can also say I have never seen an extractor failure on the Model 70 and as you know, I am exposed to a great many of them.

I would be glad to talk with anyone that would like to discuss this with me. You have my work number and I feel the 700 is an excellent system with only one shortcoming.

One other minor area of concern I have heard voiced by a number of people is in the 7MM/308 Varmint guns used in Silhouette shooting. The twist rate in these guns is not sufficiently fast to properly stabilize the 168 Sierra 7MM Matchking bullet at 500 meters and beyond. I would recommend the 7MM/308 be increased to one turn in eight inches and this variation would be ideal. I was going to buy one of these in 7mm/308 however all the negative comment I have heard has convinced me to stay away from this and get the standard 308 Varmint if I do buy one. Again this is minor and I feel the major problem to be eliminated is the extractor.

Please emphasize to the powers that be that this extractor system may be the straw that fails and I would personally hate to see a failure in an otherwise excellent system.

Hope to see you again soon. Stop in if you get down this way.

Sincerely

Mark K. Humphreville

Mark K. Humphreville

cc: File-Staff Notes
T. Douglas

RD-69-B

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington DUPONT PETERS DUPONT

"CONFINE YOUR LETTER TO ONE SUBJECT ONLY"

ILION, NEW YORK
NOVEMBER 3, 1986

TO: R. A. DARBY

FROM: W. H. COLEMAN

STAFF NOTES

SNIPER WEAPON SYSTEM

The Firearms Business Team has elected to take a more aggressive approach to military contracts. The M24 Sniper Weapon System is a new rifle/optics system for the United States Army (with marketing potential to the other military services, civilian law enforcement agencies, and competitive long-range shooters). It is designed to give pinpoint accuracy out to 800 meters. Remington's response to the Army's Request for Proposal is due on November 14.

Research is in the final testing stage of the concept rifle. It will be a Model 700 action with a Miko Rock barrel, H & S synthetic stock, and Leupold telescopic sight. Accuracy is well within requirements. Endurance testing to 5,000 rounds without going out of specification on accuracy, and 10,000 rounds for the remainder of the rifle continue. Eight rifles will be ready to submit to the Army on November 14.

The Army contract calls for 2,000 rifles over three years, at an estimated (preliminary) cost per rifle of $2,500. for a sales potential of $5MM. No permanent investment is required.

WHC:bjr

S W S Team

Production – BJ Hill

QC – WA Warren
JJ Burns

DE – TR Cuidera
D Schaaway

Research – TC Douglass

Accounting – R Dobzolecki

Int'l Sales – JD Rogers

Security – D Pearson

Safety – BG Fireman

Contract Resins – LB Fresina

Process Support – LB Bouquet
PB Tolyson
RR Washburn

DJG
11/1/86

FF-9103

1) CC T.C. Douglas

2) File SWS

REMINGTON ARMS COMPANY, INC.

INTER-DEPARTMENTAL CORRESPONDENCE

Remington

November 17, 1986

TO: W. H. COLEMAN

FROM: W. H. FORSON, JR.

SUBJ: SWS - SNIPER RIFLE PROGRAM

After completing the SWS program there are a few things I wanted to make certain you know.

The R & D team headed up by Terry Douglas did a remarkable job in assessing the needs of the Army and designing a product that meets all of their performance criteria. Their approach was to evaluate all possible alternatives and select those components for the rifle that provide superior performance. After their selections were made, they backed up all their decisions with test data that was included with our written proposal. This extra effort will no doubt have a positive influence in the Army's final selection of a product.

In order for us to make the November 14 deadline it was necessary for everyone to work extremely hard with many extra hours devoted to the project. Also the cooperation between R & D, Plant, and Marketing had to be at the highest level. Everyone on the team really pulled together to complete this project on time. It was a pleasure working with Terry Douglas and his crew. Their dedication and efforts are greatly appreciated.

Bill

WHF/nm

PC: L.E. Zeillmann
E.O. Fini

88 T C Douglas **DON'T SAY IT—*WRITE IT***

To ~~Bill Coleman~~

Date 11/18

From ~~Harvey~~

State Senator Donovan has been in touch and has sent a letter to U.S. Senator D'Amato, asking his help on M16's, SWS & Beretta.

REMINGTON ARMS CO.
RECEIVED

NOV 19 1986

FIREARMS RESEARCH DIVISION

"ACCIDENTS HAPPEN IN SECONDS, THE RESULTS CAN LAST A LIFETIME!"

bcc: Terry Douglas

Remington.

DUPONT

REMINGTON ARMS COMPANY, INC.

SPORTING ARMS-AMMUNITION-TARGETS-TRAPS

ILION, NEW YORK 13357

TELEPHONE (315) 894-9961

Harvey
- I feel a follow up to this would be in order.
Terry & John talked to Martin on their Quantico trip. He wanted to help with anything that would "SAVE JOBS"
WHL

October 16, 1986

Congressman David O'B. Martin
U.S. House of Representatives
Washington, DC 20515

Dear Congressman Martin:

I would like to take this opportunity to inform you of a significant proposal that we will be submitting to the U.S. Army. This proposal is for the Sniper Weapon System (SWS) M24, a U.S. Army non-developmental item (NDI). The complete M24 SWS will consist of the following:

- Rifle
- Day optical sight
- Back-up iron sights
- Carrying case for the sighting system
- Cleaning equipment
- Operator's manual
- System component carrying case
- Operator's deployment kit

Their current requirement is for 2,000 systems, including maintenance support, over the next four years. It is also our belief that the other armed services may adapt this system for their use. The NDI feature would also avail it to the law enforcement market.

We know we can offer a high-quality product and of great importance, made entirely in the U.S.A. Any comments or suggestions you may have in our endeavorwould be appreciated.

Sincerely,

J. D. Rogers

J. D. Rogers
Marketing Specialist

Kenny Pumpry

TEST AND MEASUREMENT LAB TEST RESULTS

REQUESTER: E.R. OWENS TESTER: R. HOWE DATE: 12/03/86
REPORT NO.: 860973 WORK ORDER NO.: R-3109
WRITTEN BY: F.L. SUPRY

TEST TYPE: MEASUREMENTS, LIVE FIRE, & DRY CYCLE OF M700 TRIGGER HOUSINGS

FIREARM STAT'S : MODEL: 700 ADL CAL or GAUGE: 30.06

REASON FOR TEST :

To determine the sensitivity of the orbital riveting process used in the small parts assembly system cell.

EQUIPMENT REQUIRED :

32 model 700 ADL 30.06 rifles, 16 "loose" and 16 control Model 700 trigger housing assemblies, Remington 30.06 ammunition, shooting jacks, dry cycle simulators, and personnel.

TEST PROCEDURE :

The trigger housings were separated into 4 groups of 8 housings each.

Group A: (loose housings for "same receiver" test)
Group B: (control housings for "same receiver" test)
Group C: (loose housings for "exchange receiver" test)
Group D: (control housings for "exchange receiver" test)

Because it was felt that the exchange test was the worst condition that the trigger housings would see, the Group C&D were tested first. The housings were measured, refer to measurement technique chart, and assembled to actions. Twenty rounds were fired through each rifle and then each rifle was dry cycled 10,000 cycles, the housings were exchanged and the procedure repeated until each housing had 100 live rounds and 50,000 dry cycles.

The group A&B housings were measured and assembled into actions. Fifty rounds were fired through each rifle and then each rifle was dry cycled 25,000 cycles, the procedure was repeated until each housing had 100 live rounds and 50,000 dry cycles.

TEST RESULTS :

All of the trigger housing assemblies completed the test without any malfunctions. There was no detrimental change in any of the trigger housings.

Two triggers broke during the dry cycle testing (A6 @ 47,000 cycles, and B6 @ 28,000 cycles). These breakages were not related to the looseness of the trigger assemblies.

Inspection and measurement sheets for each trigger housing, and a terminology sheet are included in this report.

TERMINOLOGY

LOOSE HOUSINGS - Refers to the trigger housing assemblies made on the small parts assembly system, with the orbital riveter adjusted to purposely manufacture "loose" assemblies. The riveter tools have been backed off to the point where an obvious sloppiness is present in the trigger housing assembly. The test lab will quantify looseness during measurement.

CONTROL HOUSINGS - Refers to the current production trigger housings that came assembled in the Model 700 rifles in this test.

SAME RECEIVER - These trigger assemblies will stay with the same receiver throughout the test program.

EXCHANGE RECEIVER - These trigger assemblies will be rotated into different receivers after each measurement, live fire, and 10,000 cycle iteration.

MEASUREMENTS - All measurements will be made with the trigger housing in the receiver. The test lab will quantify:

SEAR AND TRIGGER ENGAGEMENT
SEAR LIFT
TRIGGER PULL
FRONT SPACER MOVEMENT
REAR SPACER MOVEMENT

10k DRY CYCLE - The trigger and bolt will be dry cycled 10,000 times. The safety selector switch will be cycled once for every 20 cycles of the trigger and bolt.

25k DRY CYCLE - The trigger and bolt will be cycled 25,000 times. The safety selector switch will be cycled once for every 20 cycles of the trigger and bolt.

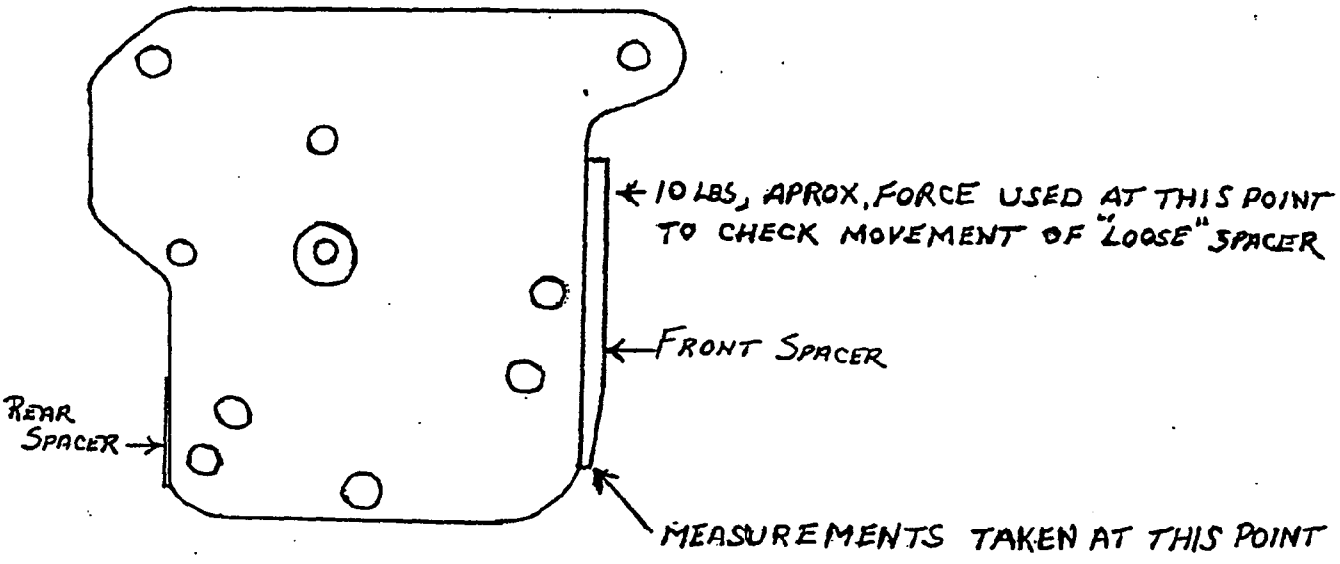
REM. STANDARDS -

Sear-Trigger Engagement -	.015 inches to .020 inches
Sear Lift -	.005 inches to .018 inches
Trigger Pull -	3.0 lbs. to 5.0 lbs.

REPORT # 860973

MEASUREMENT TECHNIQUE CHART

"LOOSE" MODEL 700 TRIGGER HOUSING ASSEMBLY EVALUATION



NOTE: USING THE APROX. 10 LB FORCE THERE WAS NO MEASUREABLE LOOSENESS OF REAR SPACER OR TRIGGER ASSEMBLY ON ANY OF THE SAMPLES TESTED.

"REMINGTON STANDARDS"

SEAR-TRIGGER ENGAGEMENT	.015" TO .020"
SEAR LIFT	.005" TO .018"
TRIGGER PULL	3.0 TO 5.0 LBS.

REPORT # 860973

CYCLES OR 25,000	REC # RECEIVER NO.	FC # FIRE CONT.	TRIG PULL LBS.	SEAR LIFT .000"	SEAR TRIGGER ENG. .000"	TRIG. TO CONN. FIT	FIRE CONTROL MOVEMENT .000"	FRONT SPACER MOVEMENT .000"	REAR SPACER MOVEMENT .000"	LIVE ROUNDS FIRED	COMMENTS
0			5.0	.017"	.019"	OK	0	.007"	0	50	
25,000	A1	A1	5.25	.017"	.020"		0	.007"	0	50	
50,000			5.25	.016"	.020"		0	007"	0	—	
0			4.5	.012"	.020"	OK	0	0	0	50	
25,000	B1	B1	4.5	.012"	.020"		0	0	0	50	
50,000			4.75	.012"	.020"		0	0	0	—	
0			5.0	.013"	.016"	OK	0	.009"	0	50	
25,000	A2	A2	5.5	.013"	.016"		0	.009"	0	50	
50,000			5.5	013"	.016"		0	.009"	0	—	
0			5.5	.018"	.023"	OK	0	0	0	50	
25,000	B2	B2	6.0	.018"	.023"		0	0	0	50	
50,000			6.0	.018"	.023" (.026)		0	0	0	—	
0			5.5	.016"	.020"	OK	0	.010"	0	50	
25,000	A3	A3	5.5	.016"	.020"		0	.010"	0	50	
50,000			5.5	.016"	.020"		0	.010"	0	—	
0			6.0	.018"	.020"	OK	0	0	0	50	
25,000	B3	B3	6.0	.018"	.020"		0	0	0	50	
50,000			6.5	.018"	.020"		0	0	0	—	
0			5.5	.013"	.015"	OK	0	.009"	0	50	
25,000	A4	A4	5.0	.013"	.015"		0	.009"	0	50	
30,000			5.5	.014"	.015"		0	.009"	0	—	
0			4.5	.016	.020"	OK	0	0	0	50	SPAN
25,000	B4	B4	4.5	.016	.020" (.022")		0	0	0	50	SPAN
50,000			5.0	.015	.020" (.023)		0	0	0	—	

NOTE: ON SEAR TRIGGER MEAS. ANY SMALL FIGURES IN PARENTHESIS INDICATE A MOVEMENT DURING DRY CYCLE AND READJUSTMENT TO INDICATED FIGURE IN CENTER OF COLUMN.

REPORT #860973

DRY CYCLES OR 25,000	REC.* RECEIVER NO.	FC.* FIRE CONT. NO.	TRIG PULL LBS.	SEAR LIFT .000"	SEAR TRIGGER ENG. .000"	TRIG. TO CONN. FIT	FIRE CONTROL MOVEMENT .000"	FRONT SPACER MOVEMENT .000"	REAR SPACER MOVEMENT .000"	LIVE ROUNDS FIRED	COMMENTS
0			5.0	.012"	.020"	OK	0	.008"	0	50	
25,000	A5	A5	5.0	.012"	.020"		0	.008"	0	50	
50,000			5.0	.012"	.021"		0	.008"	0	—	
0			5.5	.014"	.021"	OK	0	0	0	50	
25,000	B5	B5	5.5	.014"	.021"		0	0	0	50	
50,000			5.5	.014"	.021"		0	0	0	—	
0			4.25	.013"	.015"	OK	0	.007"	0	50	
25,000	A6	A6	4.25	.013"	.015"		0	.007"	0	50	
50,000			TRIGGER BROKE AT			47,000 DRY CYCLES				—	OUT OF TEST
0			4.50	.012"	.022"	OK	0	0	0	50	
25,000	B6	B6	4.50	.012"	.022"		0	0	0	50	
50,000			TRIGGER BROKE AT			28,000 DRY CYCLES				—	OUT OF TEST
0			5.0	.013"	.020"	OK	0	.010"	0	50	
25,000	A7	A7	5.5	.013"	.020"		0	.010"	0	50	
50,000			5.5	.013"	.020"		0	.010"	0	—	
0			5.5	.012"	.023"	OK	0	0	0	50	
25,000	B7	B7	5.5	.012"	.023" (026)		0	0	0	50	
50,000			6.5	.012"	.023"		0	0	0	—	
0			6.0	.016"	.023"	OK	0	.010"	0	50	
25,000	A8	A8	6.5	.016"	.023"		0	.010"	0	50	
50,000			6.5	.016"	.023"		0	.010"	0	—	
0			5.5	.015"	.021"	OK	0	0	0	50	
25,000	B8	B8	5.5	.015"	.021"		0	0	0	50	
50,000			6.0	.015"	.021"		0	0	0	—	

NOTE: ON SEAR TRIGGER MEAS. ANY SMALL FIGURES IN PARENTHESIS INDICATE A MOVEMENT DURING DRY CYCLE AND READJUSTMENT TO INDICATED FIGURE IN CENTER OF COLUMN.

REPORT # 860973

DRY CYCLES PER 10,000	REC # RECEIVER NO.	F.C.# FIRE CONT. NO.	TRIG PULL LBS.	SEAR LIFT .000"	SEAR TRIGGER ENG. .000"	TRIG. TO CONN. FIT.	FIRE CONTROL MOVEMENT .000"	FRONT SPACER MOVEMENT .000"	REAR SPACER MOVEMENT .000"	LIVE ROUNDS FIRED	COMMENTS
	C1		4.75	.017	.025	OK	0	.003	0	20	
	B1		4.75	.017	.025		0	.003	0	20	CHANGE TO REC. D1 + DRY CYC.
0,000	D1	C1	4.75	.017	.025		0	.004	0	20	" " " C1 " "
	E1		4.50	.016"	.025		0	.004	0	20	" " " D1 " "
	D1		4.75	.015	.026		0	.004	0	20	" " " C1 " "
	C1		4.50	.016	.026		0	.004	0	—	END
	D1		4.50	.014	.025	OK	0	0	0	20	
	D1		4.50	.014	.025 (.029)		0	0	0	20	CHANGE TO REC. C1 + DRY CYC.
	C1	D1	4.50	.015	.025		0	0	0	20	" " " D1 " "
	D1		4.50	.015	.025		0	0	0	20	" " " C1 " "
	C1		4.50	.015	.025 (.031)		0	0	0	20	" " " D1 " "
	D1		4.50	.015	.025		0	0	0	~~20~~	END
	C2		5.0	.013	.018	OK	0	.006	0	20	
	C2		5.0	.013	.018		0	.006	0	20	CHANGE TO REC. D2 + DRY CYC
	D2	C2	5.5	.014	.019		0	.006	0	20	" " C2 " "
	C2		5.5	.014	.019		0	.007	0	20	" " D2 " "
	D2		5.5	.014	.019		0	.007	0	20	" " C2 " "
	C2		5.5	.014	.019		0	.007	0	—	END.
	D2		5.5	.014	.022	OK	0	0	0	20	
	D2		5.0	.014	.021		0	0	0	20	CHANGE TO REC. C2 + DRY CYC
	C2	D2	5.5	.016	.022		0	0	0	20	" " D2 " "
	D2		5.5	.016	.022		0	0	0	20	" " C2 " "
	C2		5.0	.016	.022		0	0	0	20	" " D2 " "
	D2		5.5	.015	.022		0	0	0	—	END

NOTE; ON SEAR TRIGGER MEAS. ANY SMALL FIGURES IN PARENTHSIS INDICATE A MOVEMENT DURING DRY CYCLE AND READJUSTMENT TO INDICATED FIGURE IN CENTER OF COLUMN.

REPORT # 860973

DRY CYCLES PER 10,000	REC # RECEIVER NO.	FC # FIRE CONT. NO.	TRIG PULL LBS.	SEAR LIFT .000"	SEAR TRIGGER ENG. .000"	TRIG. TO CONN. FIT.	FIRE CONTROL MOVEMENT .000"	FRONT SPACER MOVEMENT .000"	REAR SPACER MOVEMENT .000"	LIVE ROUNDS FIRED	COMMENTS
)	C3	\	4.5	.013	.018	OK	0	.005	0	20	
	C3		4.5	.013	.019 (.026)		0	.005	0	20	CHANGE TO REC. D3 + DRY CYC.
	D3	C3	5.0	.013	.019		0	.005	0	20	" " C3 " "
	C3		5.0	.013	.019 (.024)		0	.005	0	20	" " D3 " "
	D3	\	5.0	.013	.019		0	.005	0	20	" " C3 " "
	C3	\	5.0	.013	.019		0	.005	0	—	END
	D3	\	5.25	.013	.020	OK.	0	0	0	20	
	D3	\	5.0	.013	.020		0	0	0	20	CHANGE TO REC. C3 + DRY CYC.
	C3	D3	5.25	.013	.020		0	0	0	20	" " D3 " "
	D3		5.25	.013	.020		0	0	0	20	" " C3 " "
	C3	\	6.0	.013	.020		0	0	0	20	" " D3 " "
	D3	\	6.0	.013	.020		0	0	0	—	END
	C4	\	5.0	.014	.020	OK	0	.003	0	20	
	C4	\	5.0	.015	.020		0	.003	0	20	CHANGE TO REC. D4 + DRY CYC.
	D4	C4	5.5	.014	.020		0	.003	0	20	" " C4 " "
	C4		6.0	.015	.020		0	.003	0	20	" " D4 " "
	D4	\	6.0	.015	.020		0	.003	0	20	" " C4 " "
	C4	\	6.0	.015	.020		0	.003	0	—	END
	D4	\	5.0	.015	.021		0	0	0	20	
	D4	\	5.5	.015	.021		0	0	0	20	CHANGE TO REC. C4 + DRY CYC.
	C4	D4	6.0	.013	.022 (.028)		0	0	0	20	" " D4 " "
	D4		6.0	.013	.022		0	0	0	20	" " C4 " "
	C4	\	6.0	.013	.022 (.026)		0	0	0	20	" " D4 " "
	D4	\	6.0	.013	.022		0	0	0	—	END

NOTE: ON SEAR TRIGGER MEAS. ANY SMALL FIGURES IN PARENTHSIS INDICATE A MOVEMENT DURING DRY CYCLE AND READJUSTMENT TO INDICATED FIGURE IN CENTER OF COLUMN.

REPORT # 860973

DRY CYCLES FOR 10,000	REC # RECEIVER NO.	FC # FIRE CONT.	TRIG PULL LBS.	SEAR LIFT .000"	SEAR TRIGGER ENG. .000"	TRIG. TO CONN. FIT	FIRE CONTROL MOVEMENT .000"	FRONT SPACER MOVEMENT .000"	REAR SPACER MOVEMENT .000"	LIVE ROUNDS FIRED	COMMENTS
	C5		5.0	.012	.017	OK	0	.011	0	20	
	C5		5.0	.012	.017		0	.011	0	20	CHANGE TO REC. D5 + DRY CYC
	D5	C5	5.0	.012	.017		0	.010	0	20	" " C5 " "
	C5		5.0	.012	.018		0	.010	0	20	" " D5 " "
	D5		5.0	.012	.017		0	.010	0	20	" " C5 " "
	C5		5.0	012	.017		0	.011	0	—	END
	D5		5.5	.015	.022	OK	0	0	0	20	
	D5		5.5	.015	.022		0	0	0	20	CHANGE TO REC. C5 + DRY CYC.
	C5	D5	5.5	.015	.022		0	0	0	20	" " D5 " "
	D5		5.5	.014	.022		0	0	0	20	" " C5 " "
	C5		5.5	.015	.022		0	0	0	20	" " D5 " "
	D5		5.5	.015	.022		0	0	0	—	END
	C6		4.0	.013	.020	OK	0	.004	0	20	
	C6		4.0	.013	.020		0	.004	0	20	CHANGE TO REC D6 + DRY CYC
	D6	C6	4.0	.012	.020		0	.004	0	20	" " C6 " "
	C6		4.0	.013	.020		0	.004	0	20	" " D6 "
	D6		4.5	013	.020		0	.004	0	20	" " C6 "
	C6		4.5	.013	.020		0	.004	0	—	END
	D6		4.5	.018	.024	OK	0	0	0	20	
	D6		4.5	.018	.024		0	0	0	20	CHANGE TO REC. C6 + DRY CYC
	C6	D6	4.5	.018	.024		0	0	0	20	" " D6 " "
	D6		4.5	.018	.023 (026)		0	0	0	20	" " C6 " "
	C6		4.5	.018	.025		0	0	0	20	" " D6 " "
	D6		5.0	.018	.025		0	0	0	—	END

NOTE: ON SEAR TRIGGER MEAS. ANY SMALL FIGURES IN PARENTHSIS INDICATE A MOVEMENT DURING DRY CYCLE AND READJUSTMENT TO INDICATED FIGURE IN CENTER OF COLUMN.

REPORT # 860973

DRY CYCLES PER 10,000	REC # RECEIVER NO.	FC # FIRE CONT.	TRIG PULL LBS.	SEAR LIFT .000"	SEAR TRIGGER ENG. .000"	TRIG. TO CONN. FIT.	FIRE CONTROL MOVEMENT .000"	FRONT SPACER MOVEMENT .000"	REAR SPACER MOVEMENT .000"	LIVE ROUNDS FIRED	COMMENTS
)	C7	\	5.0	.012	.017	OK	0	.011	0	20	
	C7	\	5.0	.012	.017		0	.011	0	20	CHANGE TO REC D7 + DRY CYC
	D7	C7	5.0	.012	.017		0	.011	0	20	" " C7 " "
	C7		5.5	.012	.017		0	.011	0	20	" " D7 " "
	D7	\	5.5	.012	.018		0	.011	0	20	" " C7 " "
	C7	\	5.5	.011	.018		0	.011	0	—	END
	D7	\	5.0	.015	.023	OK	0	0	0	20	
	D7	\	5.0	.015	.023		0	0	0	20	CHANGE TO REC. C7 + DRY CYC
	C7	D7	5.0	.015	.023		0	0	0	20	" " D7 " "
	D7		5.0	.015	.022		0	0	0	20	" " C7 " "
	C7	\	5.5	.015	.023		0	0	0	20	" " D7 " "
	D7	\	5.5	.015	.023		0	0	0	—	END
	C8	\	5.5	.015	.015	OK	0	.010	0	20	
	C8	\	5.5	.015	015		0	.010	0	20	CHANGE TO REC. D8 + DRY CYC
	D8	C8	5.5	.015	015 (020)		0	.010	0	20	" " C8 " "
	C8		5.5	.015	.015 (019)		0	.010	0	20	" " D8 " "
	D8	\	5.5	.015	.015		0	.010	0	20	" " C8 " "
	C8	\	5.5	.015	.015		0	.010	0	—	END
	D8	\	4.5	.015	.019	OK	0	0	0	20	
	D8	\	4.5	.015	.019		0	0	0	20	CHANGE TO REC C8 + DRY CYC
	C8	D8	4.5	.015	.019		0	0	0	20	" " D8 " "
	D8		4.5	015	.019		0	0	0	20	" " C8 " "
	C8	\	4.5	015	.019		0	0	0	20	" " D8 " "
	D8	\	5.0	015	.018		0	0	0	—	END

NOTE: ON SEAR TRIGGER MEAS. ANY SMALL FIGURES IN PARENTHSIS INDICATE A MOVEMENT DURING DRY CYCLE AND READJUSTMENT TO INDICATED FIGURE IN CENTER OF COLUMN.

TEST AND MEASUREMENT LAB TEST RESULTS

REQUESTER: F.H. SMITH TESTER: TEST LAB DATE: 12/04/86
REPORT NO.: 862741 WORK ORDER NO.: C-0605
WRITTEN BY: F.L. SUPRY

TEST TYPE: SYNTHETIC STOCKS - ACCURACY @ TEMPERATURE VARIATIONS & DROP TEST

REASON FOR TEST :

To determine the affect of temperature variations on the experimental synthetic stocks, using 100 yard accuracy as a test comparison. Also to check the stocks for breakages from temperature variation and drop testing.

EQUIPMENT REQUIRED :

Three experimental synthetic stocks (1 dark gray BDL, 1 light gray ADL, and 1 rynite BDL), 1 standard wood BDL stock, an oven, a freezer, 30.06 Remington ammunition, an 85 durometer rubber mat, HP 9000 computer and digitizing tablet, and personnel.

TEST PROCEDURE :

Three, 5 shot groups, at 100 yards and at ambient temperature, were shot with each stock. The same action was used in each stock. Each stock, with an action assembled to it, was subject to 16 hours at -40 degrees F. The stocks were allowed to return to ambient temperature and the accuracy procedure was repeated. The stocks, with actions, were then subjected to 24 hours at +250 degrees F. The stocks were allowed to return to ambient temperature and the accuracy procedure was repeated. All the 100 yard targets were digitized and analyzed using the HP 9000 computer. After the accuracy test was completed a drop test was conducted.

TEST RESULTS :

The Butt Plate came off the Rynite stock during the +250 degree F. bake. Also, On the rynite stock, the butt plate came off on the right side drop at 24 inches. This butt plate had been replaced to complete the accuracy test and was protruding 1/4 inch past the edge of the stock.

On the light gray ADL stock, 3 1/2 inches of the right rail broke off the forend section on the left side drop at 48 inches.

On the dark gray BDL stock, a large crack through the grip area, and a small crack at the forend tip (left side) was found after the completion of the drop test.

On the wood stock, the stock cracked 1 1/4 inches on each side of the Trigger Guard, and 1 inch from the checkering to the bolt slot (at the tang behind the safe lever) and a piece behind the bolt slot broke out.

The accuracy results are included in the appendix of this report.

JAR OFF TEST

FIREARM # _____ REPORT # 862741

MODEL 700 LIGHT GREY - ADL. W.O. # _____

TRIGGER PULL LBS. X NA. SAFE "OFF" POSITION

J.O. = "JAR OFF"

	SAAMI SPEC 12" DROP			18" DROP			24" DROP		
	#1	2	3	#1	2	3	#1	2	3
AR. VERT. MUZZLE UP	OK	OK	OK	OK	OK	OK	OK	OK	OK
" " MUZZLE DOWN	"	"	"	"	"	"	"	"	"
AR. HORZ. BOTTOM UP	"	"	"	"	"	"	"	"	"
" " BOTTOM DOWN	"	"	"	"	"	"	"	"	"
" " LEFT. SIDE UP	"	"	"	"	"	"	"	"	"
" " RIGHT SIDE UP	"	"	"	"	"	"	"	"	"

"DROP TEST" SAFE "ON" POSITION

	SAAMI SPEC. 48" DROP			54" DROP		
	#1	2	3	#1	2	3
AR. VERT. MUZZLE UP	OK	OK	OK			
" " MUZZLE DOWN	"	"	"			
AR HORZ. BOTTOM UP	"	"	"			
" " BOTTOM DOWN	"	"	"			
" " LEFT SIDE UP	*	"	"			
" " RIGHT SIDE UP	OK	OK	OK			

* APROX 3½" OF RIGHT RAIL BROKE OFF FORE END AT 48" LIFT SIDE UP DROP #1

"ROTATION TEST" SAFE "ON" POSITION

SAAMI SPEC.
ALL DROPS ON 1" 85±5
DIAMETER (SHORE A) RUBBER
MAT BACKED BY CONCRETE

	RIGHT SIDE UP			LEFT SIDE UP		
	#1	2	3	#1	2	3
	OK	OK	OK	OK	OK	OK

"JAR OFF TEST"

FIREARM # REPORT # 862741

MODEL P00 DARK GRAY - B.D.L. W.O. #

TRIGGER PULL LBS. + NA SAFE "OFF" POSITION

J.O. = "JAR OFF"	SAAMI SPEC 12" DROP			18" DROP			24" DROP		
	#1	2	3	#1	2	3	#1	2	3
HR. VERT. MUZZLE UP	OK	OK	OK	OK	OK	OK	OK	OK	OK
" " MUZZLE DOWN	"	"	"	"	"	"	"	"	"
HR. HORZ. BOTTOM UP	"	"	"	"	"	"	"	"	"
" " BOTTOM DOWN	"	"	"	"	"	"	"	"	"
" " LEFT SIDE UP	"	"	"	"	"	"	"	"	"
" " RIGHT SIDE UP	"	"	"	"	"	"	"	"	"

"DROP TEST" SAFE "ON" POSITION

	SAAMI SPEC. 48" DROP			54" DROP		
	#1	2	3	#1	2	3
OR. VERT. MUZZLE UP	OK	OK	OK	OK	OK	OK
" " MUZZLE DOWN	"	"	"	"	"	"
R HORZ. BOTTOM UP	"	"	"	"	"	"
" " BOTTOM DOWN	"	"	"	"	"	"
" " LEFT SIDE UP	"	"	"	"	"	"
" " RIGHT SIDE UP	"	"	"	"	"	*

* LARGE CRACK AROUND APROX 80% OF STOCK AT REAR MOUNTING SCREW HOLE NOTICED AT END OF DROP TEST ALSO A 3/8" CRACK AT LEFT RAIL FORE END TIP

ROTATION TEST SAFE "ON" POSITION

SAAMI SPEC.

ALL DROPS ON 1" 86 ± 5 DUROMETER (SHORE A) RUBBER MAT BACKED BY CONCRETE

RIGHT SIDE UP			LEFT SIDE UP		
#1	2	3	#1	2	3
OK	OK	OK	OK	OK	OK

"JAR OFF TEST"

FIREARM # _____ REPORT # 862741

MODEL 700 RYHITE STOCK - BDL- W.O. # _____

TRIGGER PULL LBS. NA SAFE "OFF" POSITION

J.O. = "JAR OFF"

	SAAMI SPEC 12" DROP			18" DROP			24" DROP		
	#1	2	3	#1	2	3	#1	2	3
AR. VERT. MUZZLE UP	OK	OK	OK	OK	OK	OK	OK	OK	OK
" " MUZZLE DOWN	"	"	"	"	"	"	"	"	"
AR. HORZ. BOTTOM UP	"	"	"	"	"	"	"	"	"
" " BOTTOM DOWN	"	"	"	"	"	"	"	"	"
" " LEFT. SIDE UP	"	"	"	"	"	"	"	"	"
" " RIGHT SIDE UP	"	"	"	"	"	"	*	"	"

* BUTT PLATE CAME OFF - SEE NOTE ON BACK

"DROP TEST" SAFE "ON" POSITION

	SAAMI SPEC. 48" DROP			54" DROP		
	#1	2	3	#1	2	3
AR. VERT MUZZLE UP	OK	OK	OK	OK	OK	OK
" " MUZZLE DOWN	"	"	"	"	"	"
AR HORZ. BOTTOM UP	"	"	"	"	"	"
" " BOTTOM DOWN	"	"	"	"	"	"
" " LEFT SIDE UP	"	"	"	"	"	"
" " RIGHT SIDE UP	"	"	"	"	"	"

"ROTATION TEST" SAFE "ON" POSITION

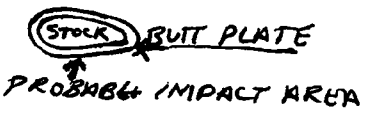
SAAMI SPEC.

ALL DROPS ON 1" 96±5 DUROMETER (SHORE A) RUBBER MAT BACKED BY CONCRETE

RIGHT SIDE UP			LEFT SIDE UP		
#1	2	3	#1	2	3
OK	OK	OK	OK	OK	OK

* NOTE.

BUTT PLATE HAD BEEN CEMENTED ON BUT NOT TRIMMED FLUSH WITH STOCK. HAD APROX ¼" PROTRUDING PAST STOCK,



BUTT PLATE PROBABLY WOULD HAVE HELD IF IT HAD BEEN TRIMMED FLUSH WITH STOCK.

"JAR OFF TEST"

FIREARM # _____ REPORT # 862741

MODEL 700 REG WOOD BDL W.O. # _____

TRIGGER PULL LBS. X NA SAFE "OFF" POSITION

J.O. = "JAR OFF"	SAAMI SPEC 12" DROP #1	2	3	18" DROP #1	2	3	24" DROP #1	2	3
AR. VERT. MUZZLE UP	OK	OK	OK	OK	OK	OK	OK	OK	OK
" " MUZZLE DOWN	"	"	"	"	"	"	"	"	"
AR. HORZ. BOTTOM UP	"	"	"	"	"	"	"	"	"
" " BOTTOM DOWN	"	"	"	"	"	"	"	"	"
" " LEFT. SIDE UP	"	"	"	"	"	"	"	"	"
" " RIGHT SIDE UP	"	"	"	"	"	"	"	"	"

"DROP TEST" SAFE "ON" POSITION

	SAAMI SPEC. 48" DROP #1	2	3	54" DROP #1	2	3
AR. VERT. MUZZLE UP	OK	OK	OK	OK	OK	OK
" " MUZZLE DOWN	"	"	"	"	"	"
AR HORZ. BOTTOM UP	"	"	"	"	*	*
" " BOTTOM DOWN	"	"	"	"	OK	OK
" " LEFT SIDE UP	"	"	"	"	"	"
" " RIGHT SIDE UP	"	"	"	"	"	"

* SEE NOTE ON BACK

"ROTATION TEST" SAFE "ON" POSITION

SAAMI SPEC.
ALL DROPS ON 1" 86 ± 5
DUROMETER (SHORE A) RUBBER
MAT BACKED BY CONCRETE

RIGHT SIDE UP #1	2	3	LEFT SIDE UP #1	2	3
OK	OK	OK	OK	OK	OK

NOTE
* 54" DROP
BAR HORZ. BOTTOM UP

DROP #2
CRACK ON EACH SIDE OF REAR OF TRIGGER GUARD BACK TO GRIP APROX 1½" LONG ALSO CRACK FROM FRONT OF CHECKERING TO BOLT SLOT RIGHT SIDE & CRACK 1" AT TANG BEHINDE SAFE LEVER.

DROP #3
PIECE BEHINDE BOLT SLOT BROKE OUT

862741
- SYNTHETIC STOCK FOR 700 (30.06)

COMPLETED 12/9/86
REPORT ISSUED 12/11/86

TEST AND MEASUREMENT LAB TEST RESULTS

REQUESTER: F.H. SMITH TESTER: TEST LAB DATE: 12/04/86
REPORT NO.: 862741 WORK ORDER NO.: C-0605
WRITTEN BY: F.L. SUPRY

TEST TYPE: SYNTHETIC STOCKS - ACCURACY @ TEMPERATURE VARIATIONS & DROP TEST

REASON FOR TEST :

To determine the affect of temperature variations on the experimental synthetic stocks, using 100 yard accuracy as a test comparison. Also to check the stocks for breakages from temperature variation and drop testing.

EQUIPMENT REQUIRED :

Three experimental synthetic stocks (1 dark gray BDL, 1 light gray ADL, and 1 rynite BDL), 1 standard wood BDL stock, an oven, a freezer, 30.06 Remington ammunition, an 85 durometer rubber mat, HP 9000 computer and digitizing tablet, and personnel.

TEST PROCEDURE :

Three, 5 shot groups, at 100 yards and at ambient temperature, were shot with each stock. The same action was used in each stock. Each stock, with an action assembled to it, was subject to 16 hours at -40 degrees F. The stocks were allowed to return to ambient temperature and the accuracy procedure was repeated. The stocks, with actions, were then subjected to 24 hours at +250 degrees F. The stocks were allowed to return to ambient temperature and the accuracy procedure was repeated. All the 100 yard targets were digitized and analyzed using the HP 9000 computer. After the accuracy test was completed a drop test was conducted.

TEST RESULTS :

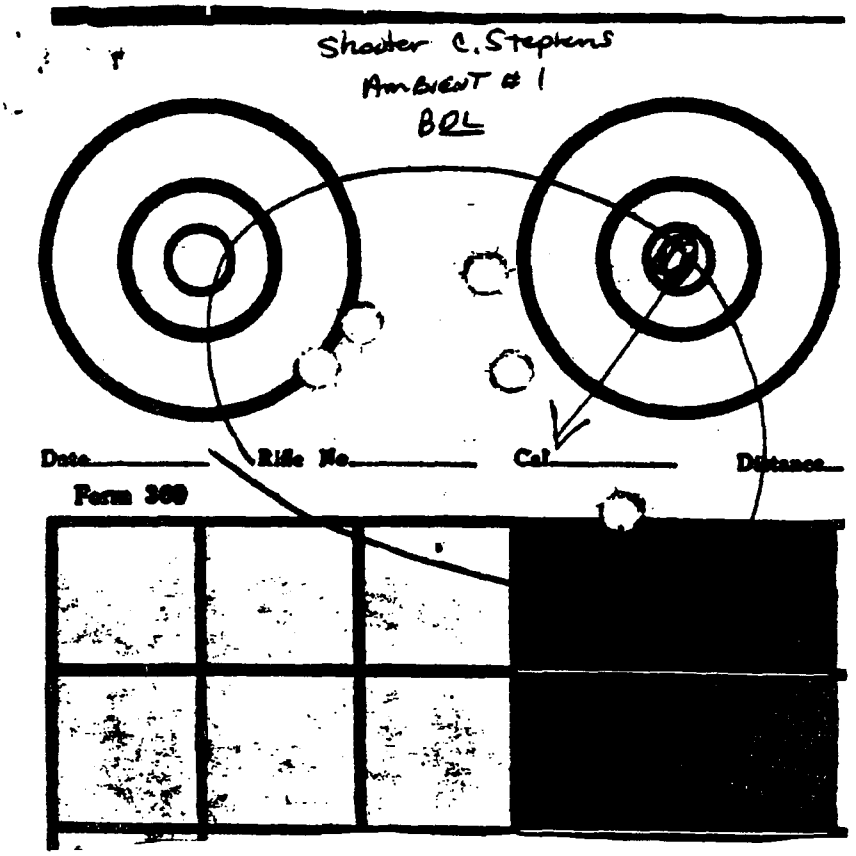
The Butt Plate came off the Rynite stock during the +250 degree F. bake. Also, On the rynite stock, the butt plate came off on the right side drop at 24 inches. This butt plate had been replaced to complete the accuracy test and was protruding 1/4 inch past the edge of the stock.

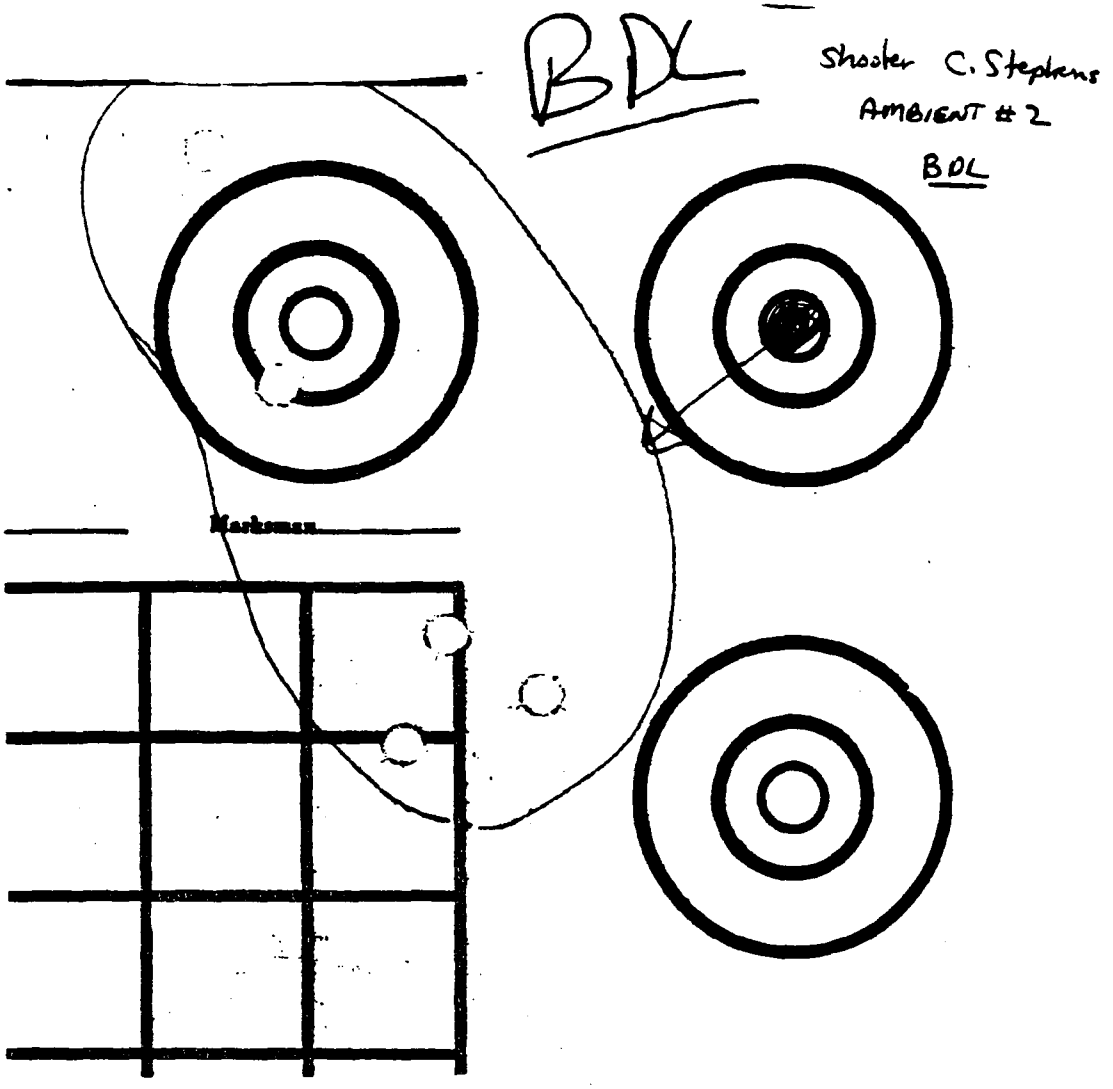
On the light gray ADL stock, 3 1/2 inches of the right rail broke off the forend section on the left side drop at 48 inches.

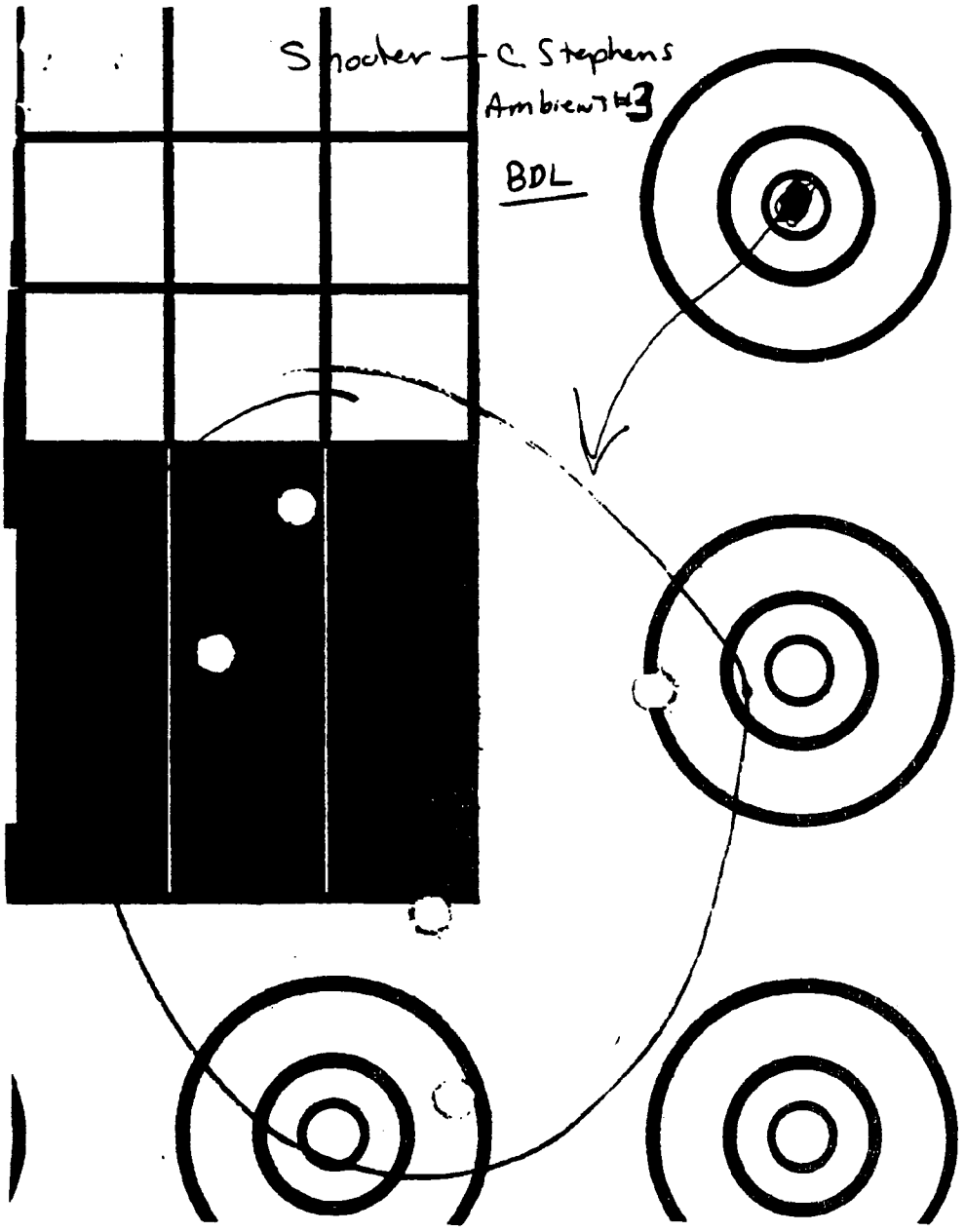
On the dark gray BDL stock, a large crack through the grip area, and a small crack at the forend tip (left side) was found after the completion of the drop test.

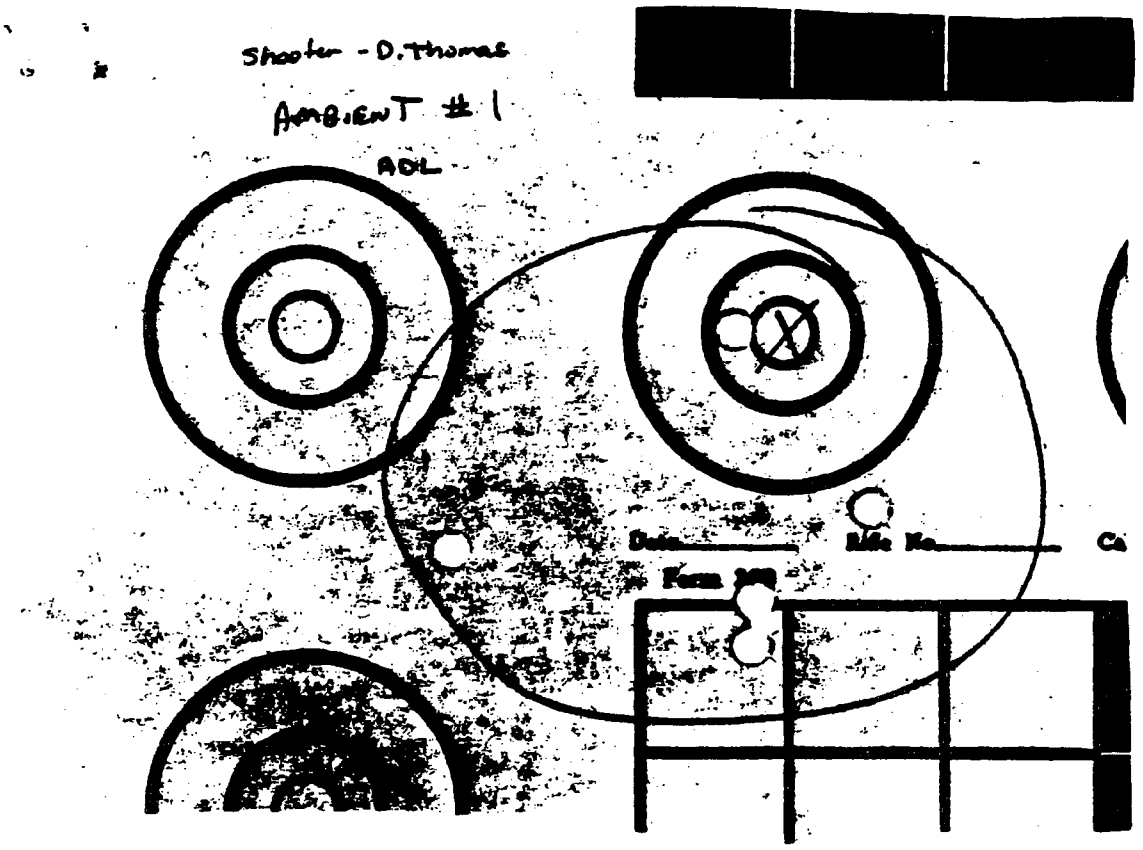
On the wood stock, the stock cracked 1 1/4 inches on each side of the Trigger Guard, and 1 inch from the checkering to the bolt slot (at the tang behind the safe lever) and a piece behind the bolt slot broke out.

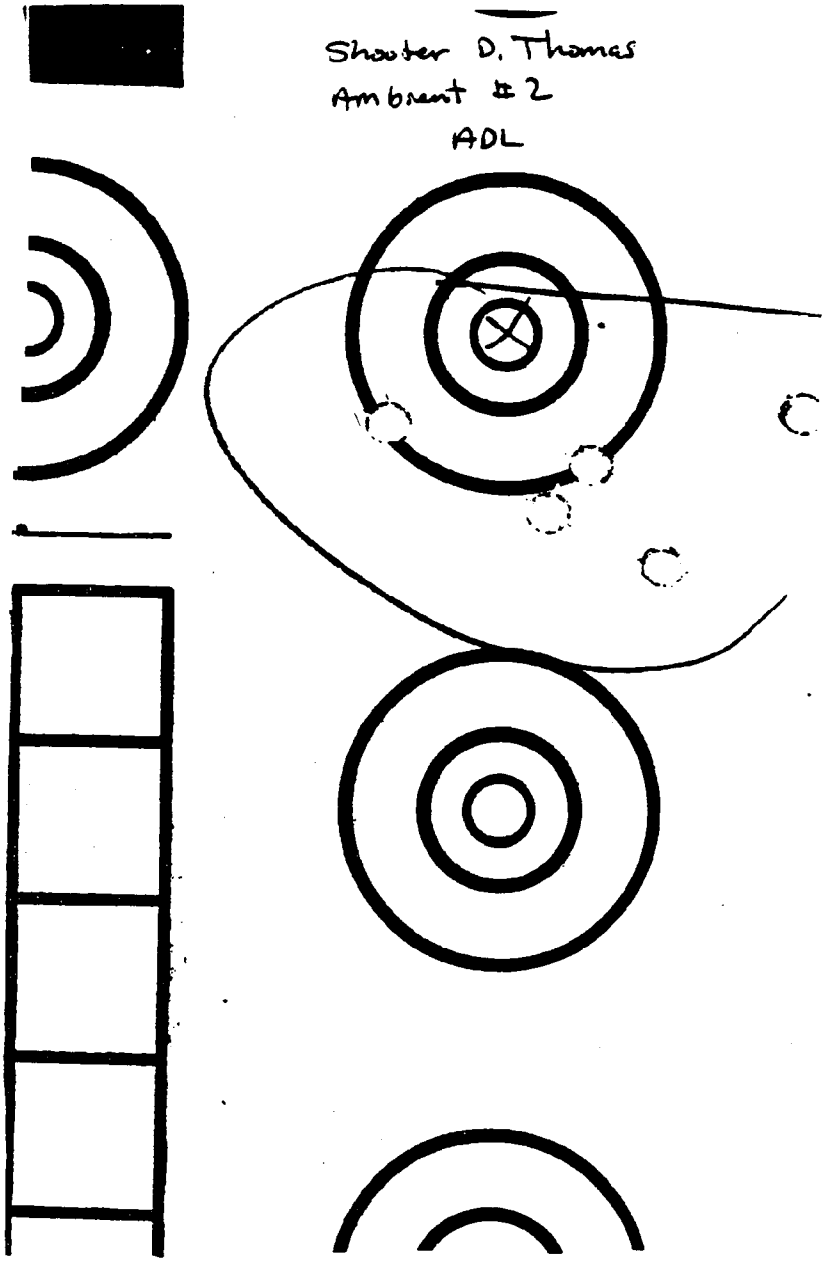
The accuracy results are included in the appendix of this report.

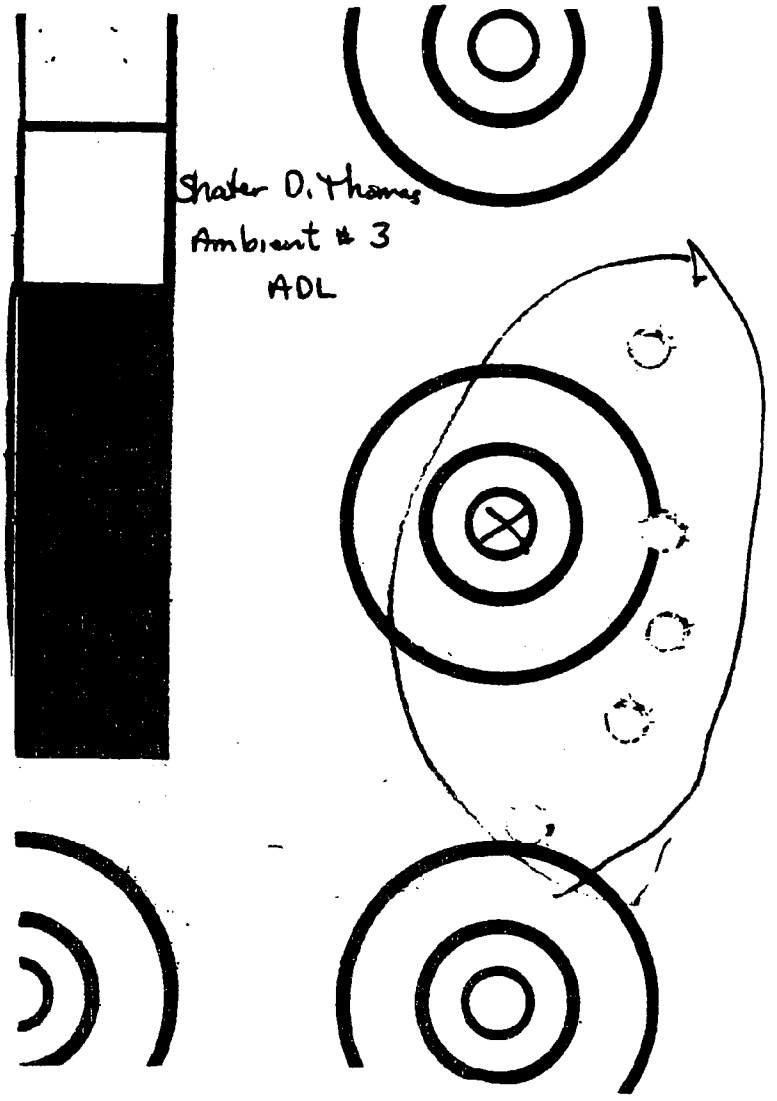

Shooter C. Stephens
AMBIENT # 1
BRL
Date
Rifle No.
Cal.
Distance
Form 369

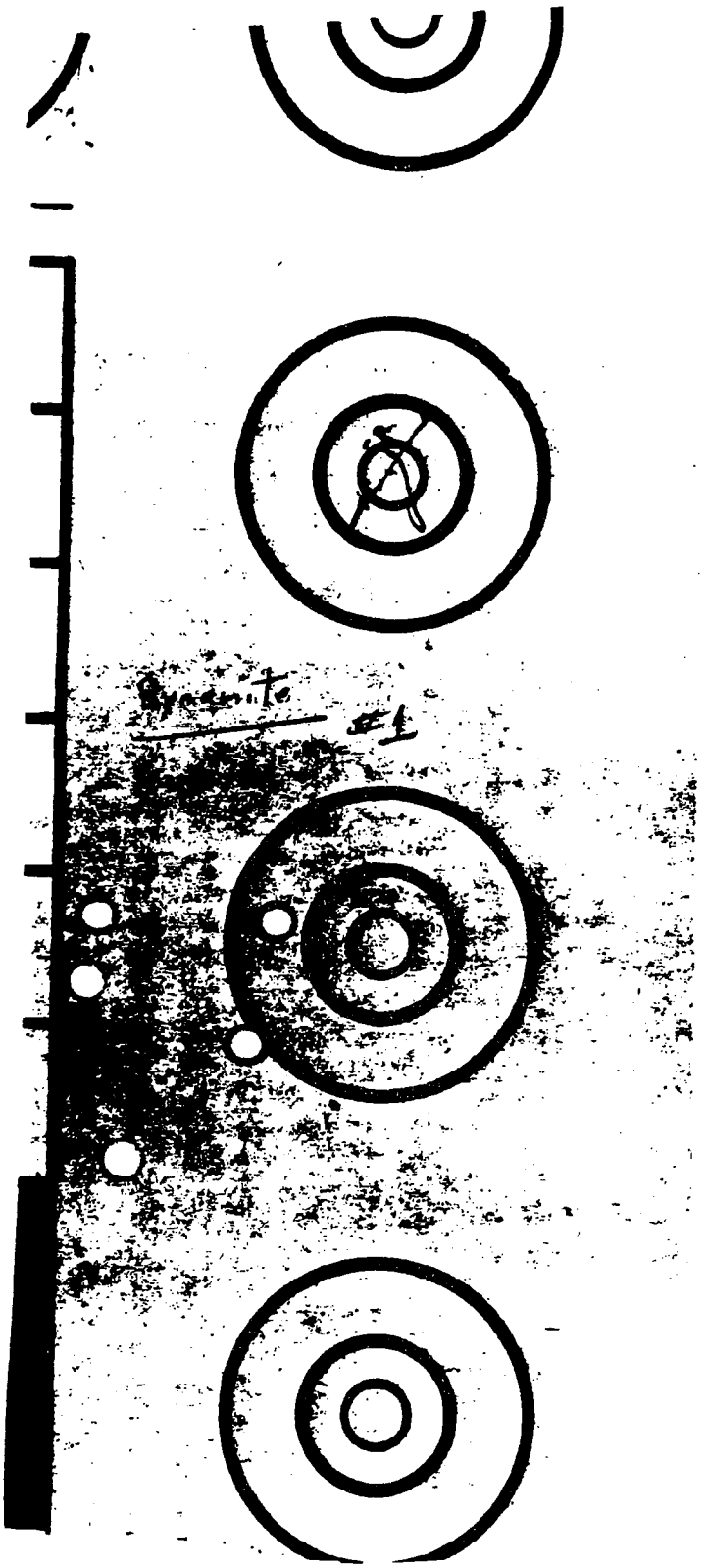

BDL
Shooter C. Stephens
AMBIENT #2
BDL
Marksman

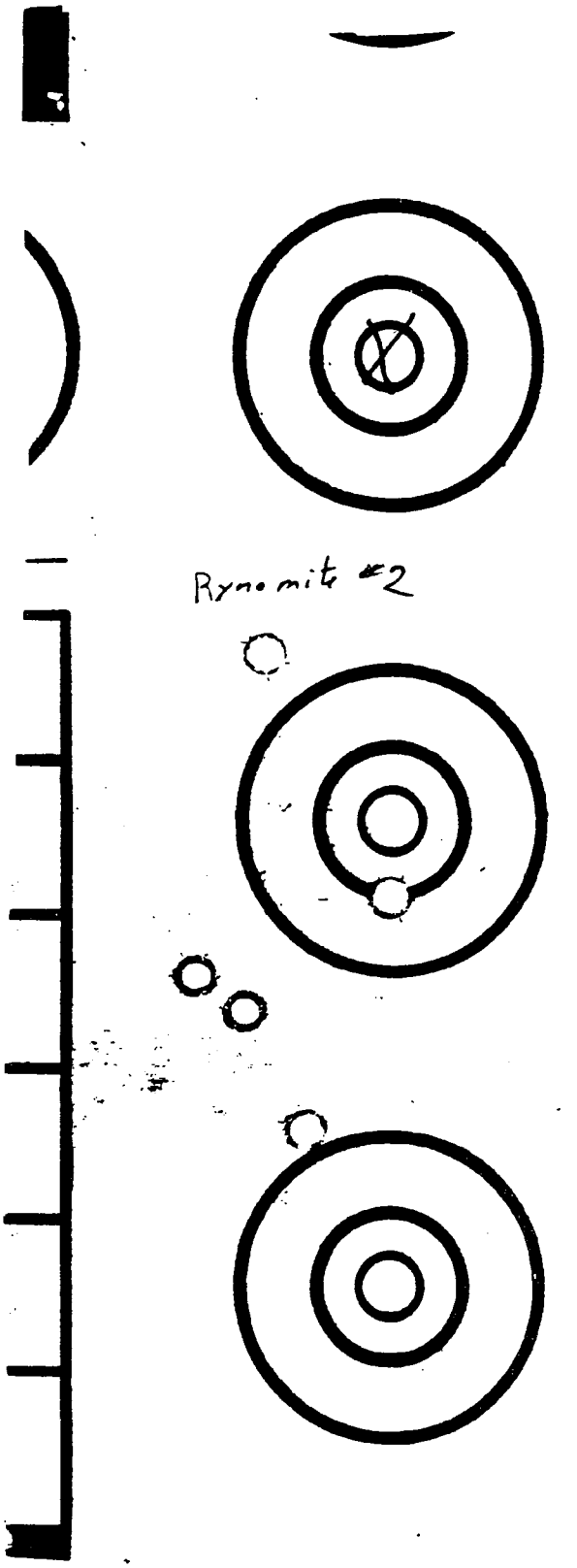

Shooter – C. Stephens
Ambient #3
BDL

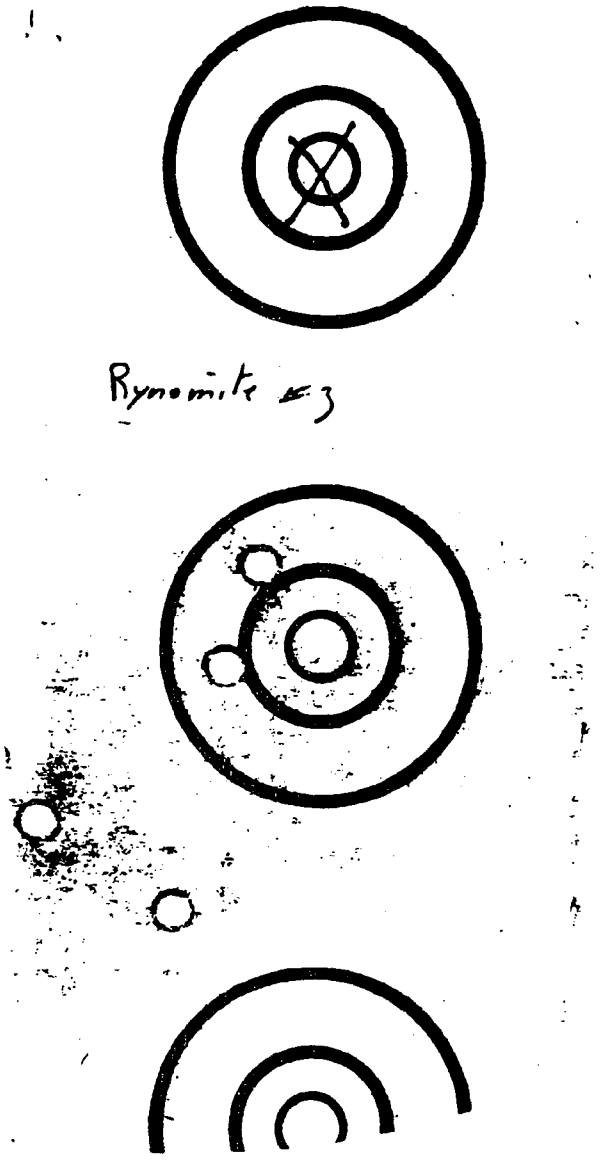

Shooter - D. Thomas
AMBIENT #1
ADL

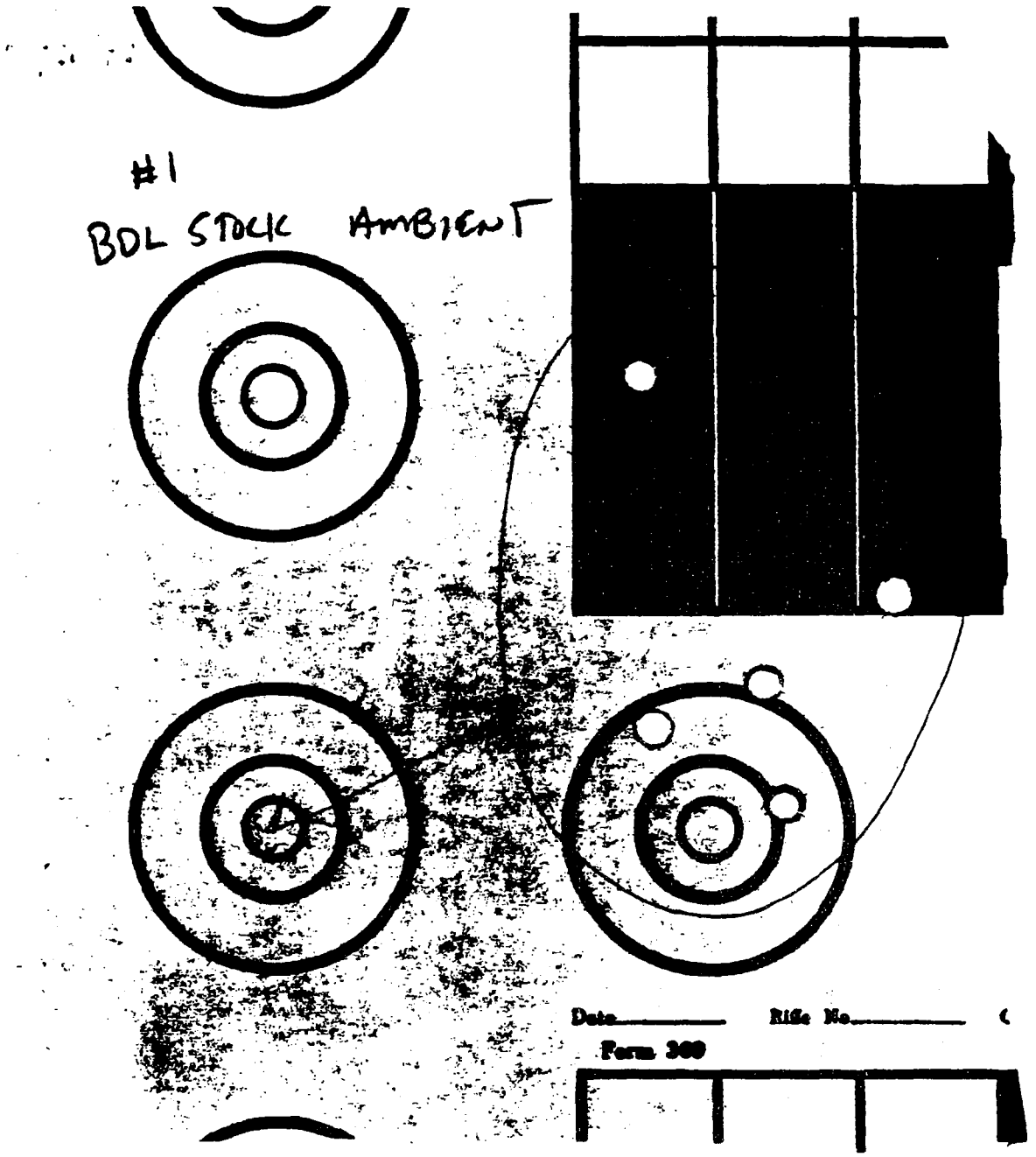

Shooter D. Thomas
Ambient #2
ADL

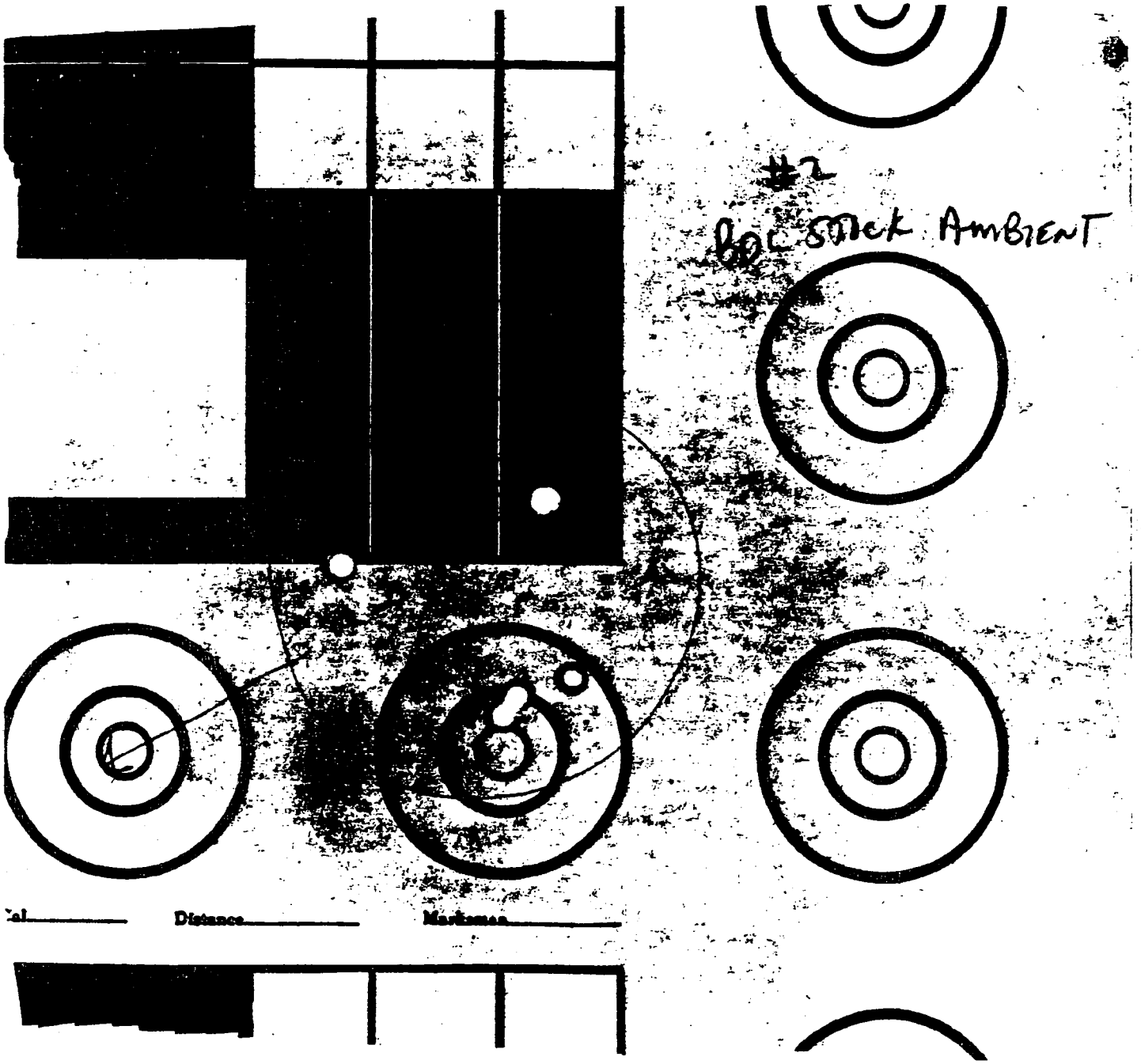

Shaker D. Thomas
Ambient # 3
ADL

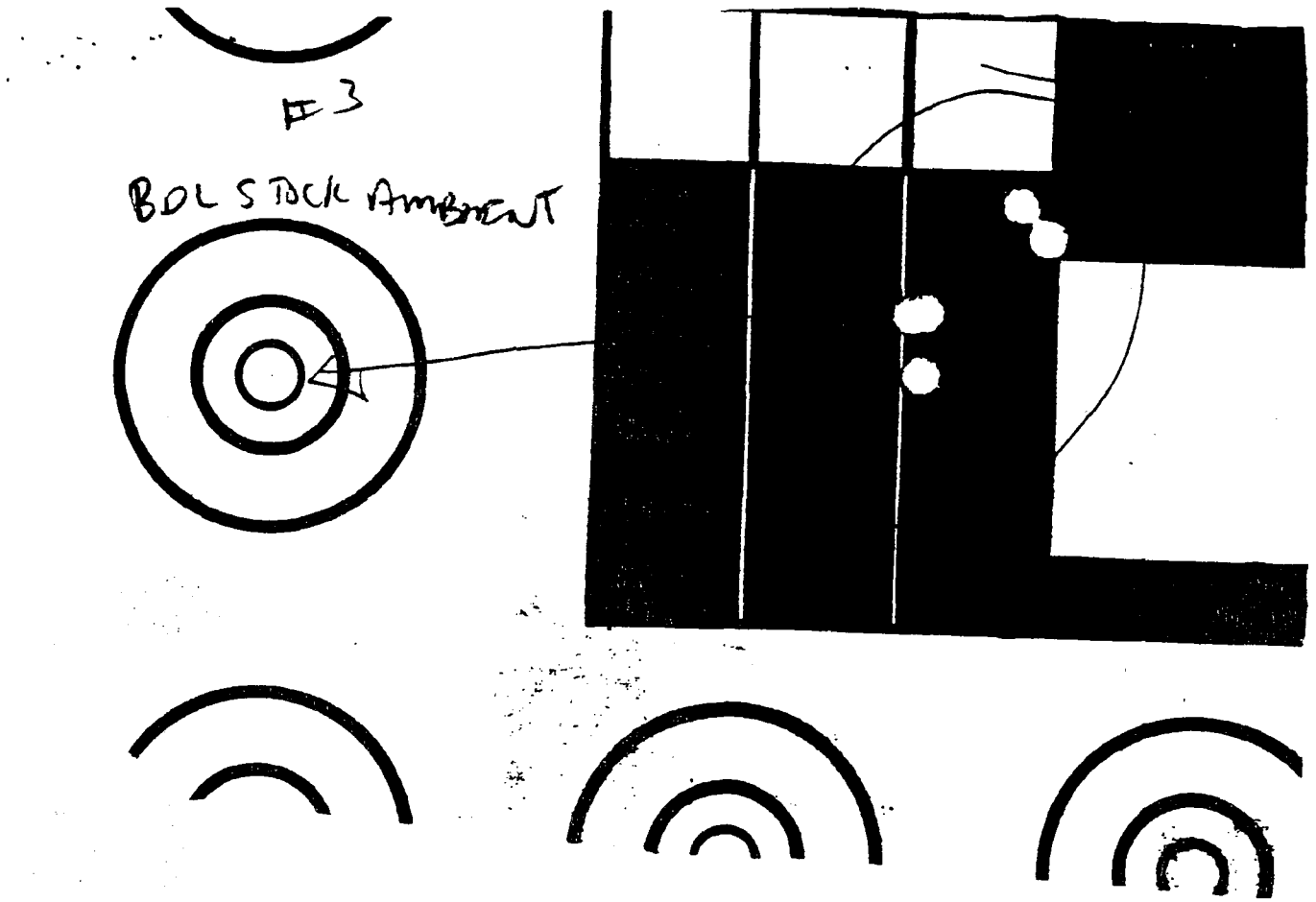



Rynomite #2


Rynomite #3


#1
BDL STOCK AMBIENT
Date
Rifle No.
Form 300

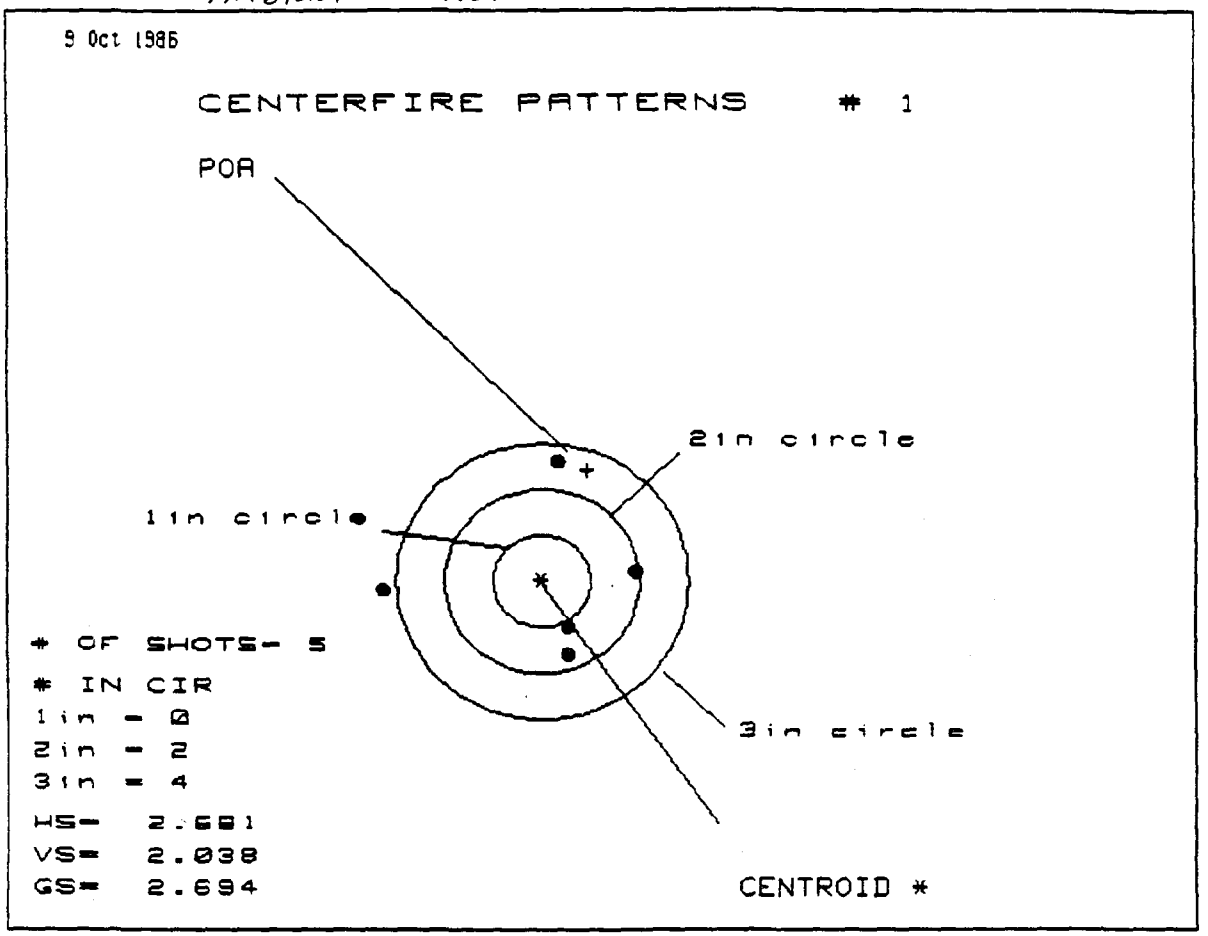

#2
Bbl Stock Ambient
Distance
Marksman


#3
BOLSTOCK AMBIENT

AMBIENT ADL

9 Oct 1986

CENTERFIRE PATTERNS # 1



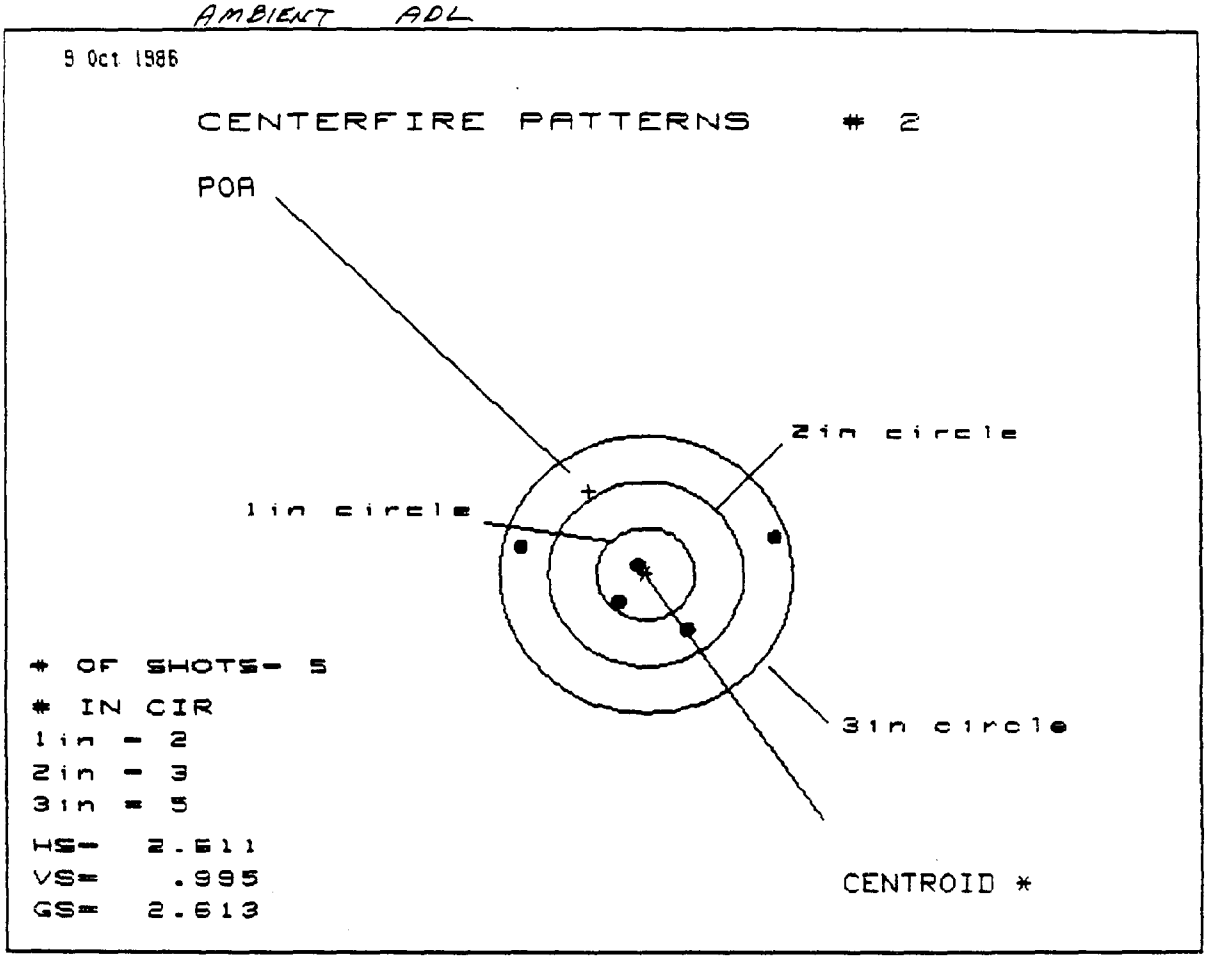
# OF SHOTS= 5
# IN CIR
1in = 0
2in = 2
3in = 4
HS= 2.681
VS= 2.038
GS= 2.694

PATTERN #	:	[redacted]		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.005	.586	.494
MINIMUM X	:	-1.676	-.276	-.248
MAXIMUM Y	:	1.260	1.225	.501
MINIMUM Y	:	-.778	-.813	-.405
CENTROID X	:	-.460	-.040	.051
CENTROID Y	:	-1.207	-1.172	-1.580
POA TO CENTROID in.	:	1.291	1.173	1.581
MIN RADIUS	:	.540	.528	.264
MEAN RADIUS	:	1.065	.881	.481
MAX RADIUS	:	1.682	1.256	.704
HORIZONTAL SPREAD	:	2.681	.861	.742
VERTICAL SPREAD	:	2.038	2.038	.906
EXTREME SPREAD	:	2.694	2.041	1.171
NUMBER IN ONE INCH CIRCLE	=		0	
NUMBER IN TWO INCH CIRCLE	=		2	
NUMBER IN THREE INCH CIRCLE	=		4	

AMBIENT ADL

9 Oct 1986

CENTERFIRE PATTERNS # 2

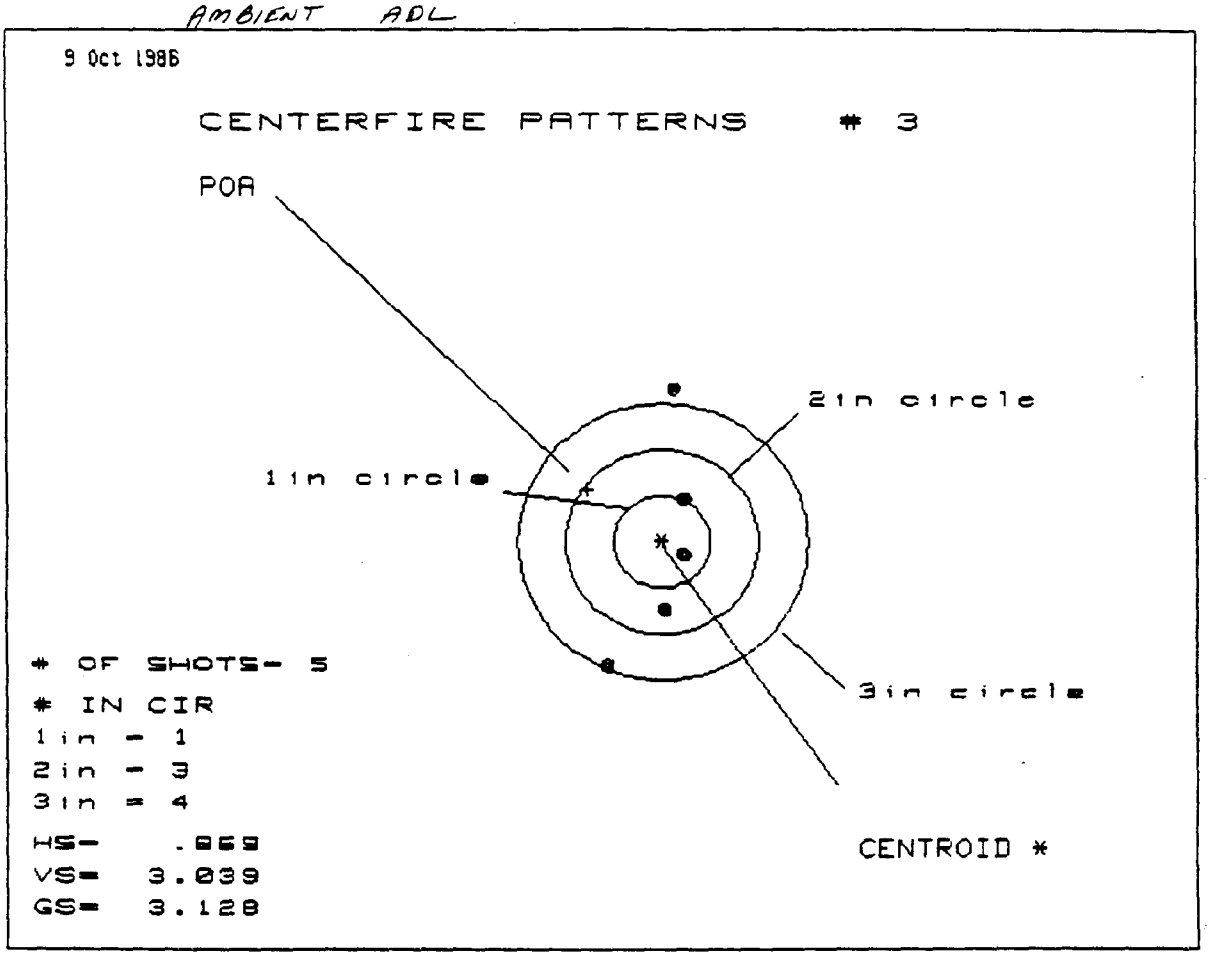


PATTERN #	:	[redacted]		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.293	.728	.396
MINIMUM X	:	-1.318	-.995	-.334
MAXIMUM Y	:	.423	.435	.323
MINIMUM Y	:	-.572	-.467	-.321
CENTROID X	:	.581	.258	.590
CENTROID Y	:	-.901	-1.006	-1.152
POA TO CENTROID in.	:	1.072	1.039	1.294
MIN RADIUS	:	.089	.147	.329
MEAN RADIUS	:	.784	.605	.391
MAX RADIUS	:	1.360	1.086	.510
HORIZONTAL SPREAD	:	2.611	1.723	.730
VERTICAL SPREAD	:	.995	.902	.644
EXTREME SPREAD	:	2.613	1.945	.797
NUMBER IN ONE INCH CIRCLE	=		2	
NUMBER IN TWO INCH CIRCLE	=		3	
NUMBER IN THREE INCH CIRCLE	=		5	

AMBIENT ADL

9 Oct 1986

CENTERFIRE PATTERNS # 3



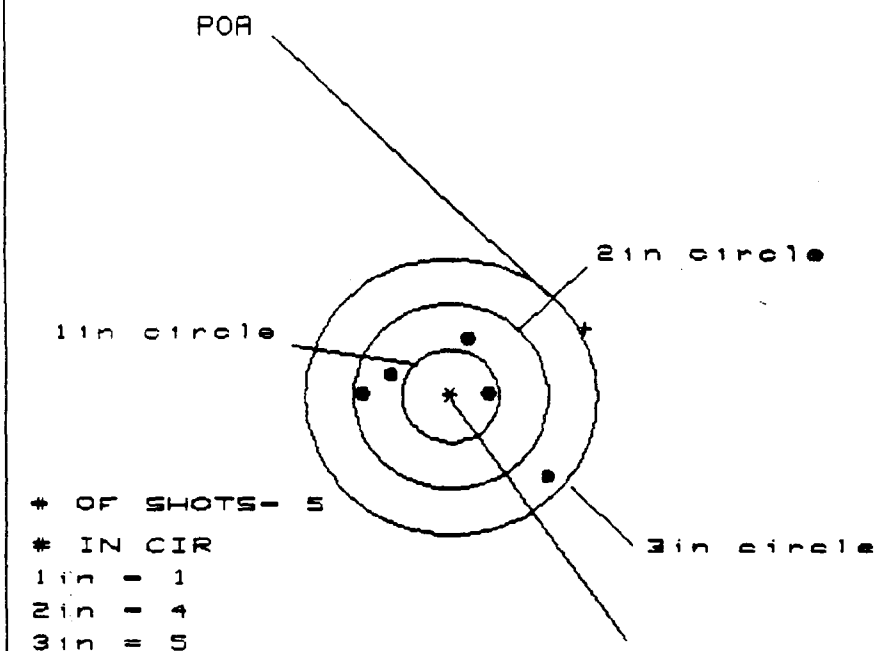
# OF SHOTS= 5
# IN CIR
1in = 1
2in = 3
3in = 4
HS= .869
VS= 3.039
GS= 3.128

PATTERN #	:	[redacted]		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.258	.290	.098
MINIMUM X	:	-.611	-.578	-.145
MAXIMUM Y	:	1.701	.901	.596
MINIMUM Y	:	-1.338	-.913	-.586
CENTROID X	:	.775	.742	.935
CENTROID Y	:	-.565	-.990	-.685
POA TO CENTROID in.	:	.959	1.237	1.160
MIN RADIUS	:	.290	.285	.098
MEAN RADIUS	:	.938	.678	.433
MAX RADIUS	:	1.706	1.081	.603
HORIZONTAL SPREAD	:	.869	.869	.243
VERTICAL SPREAD	:	3.039	1.814	1.182
EXTREME SPREAD	:	3.128	1.990	1.198
NUMBER IN ONE INCH CIRCLE	=		1	
NUMBER IN TWO INCH CIRCLE	=		3	
NUMBER IN THREE INCH CIRCLE	=		4	

BDL AMBIENT

9 Oct 1986

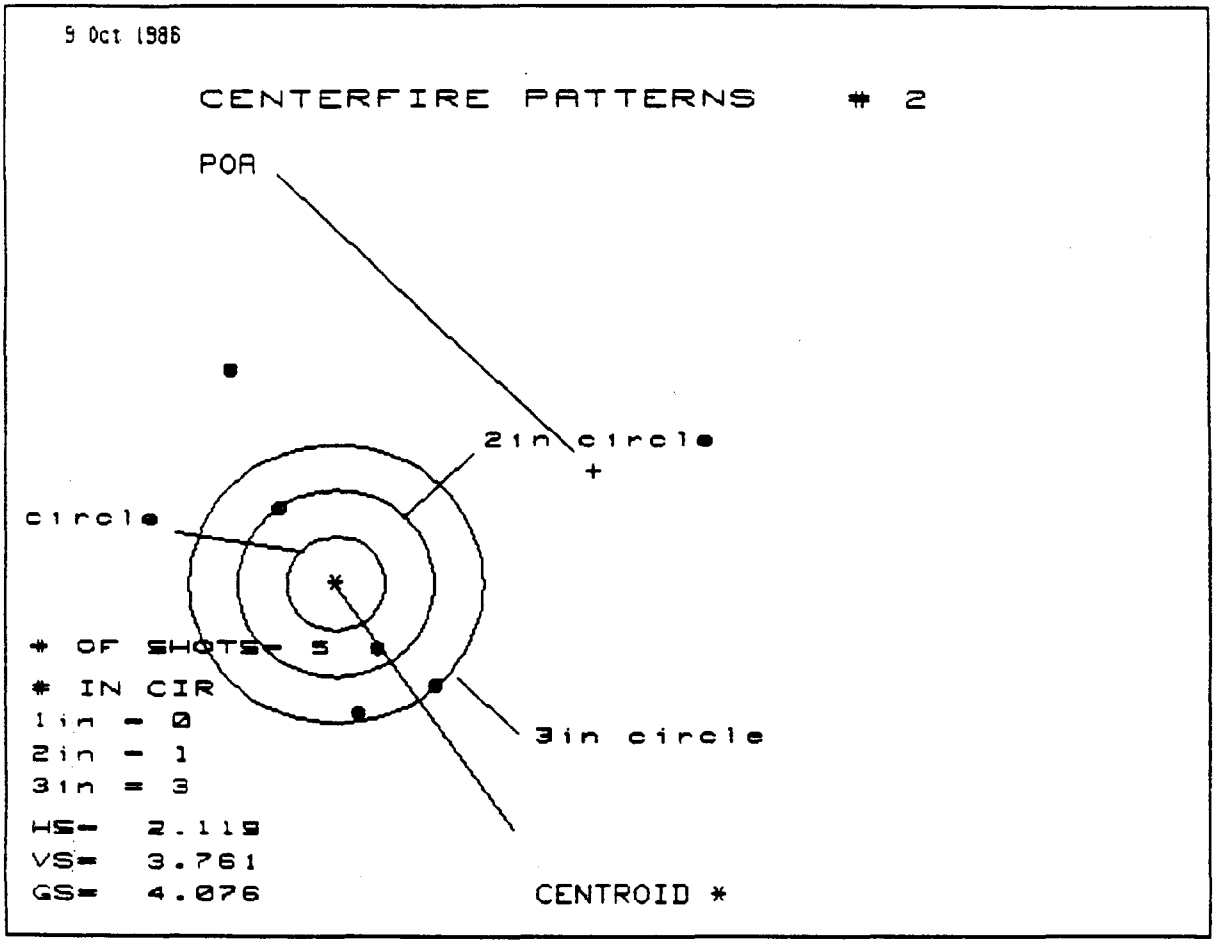
CENTERFIRE PATTERNS # 1



# OF SHOTS= 5
# IN CIR
1in = 1
2in = 4
3in = 5
HS= 1.896
VS= 1.507
GS= 2.112

PATTERN #	:	[redacted]		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.008	.604	.392
MINIMUM X	:	-.888	-.636	-.595
MAXIMUM Y	:	.592	.363	.292
MINIMUM Y	:	-.915	-.213	-.271
CENTROID X	:	-1.384	-1.636	-1.424
CENTROID Y	:	-.730	-.501	-.430
POA TO CENTROID in.	:	1.565	1.711	1.488
MIN RADIUS	:	.353	.386	.356
MEAN RADIUS	:	.782	.561	.476
MAX RADIUS	:	1.362	.670	.595
HORIZONTAL SPREAD	:	1.896	1.240	.987
VERTICAL SPREAD	:	1.507	.576	.563
EXTREME SPREAD	:	2.112	1.240	1.018
NUMBER IN ONE INCH CIRCLE	=		1	
NUMBER IN TWO INCH CIRCLE	=		4	
NUMBER IN THREE INCH CIRCLE	=		5	

BDL AMBIENT

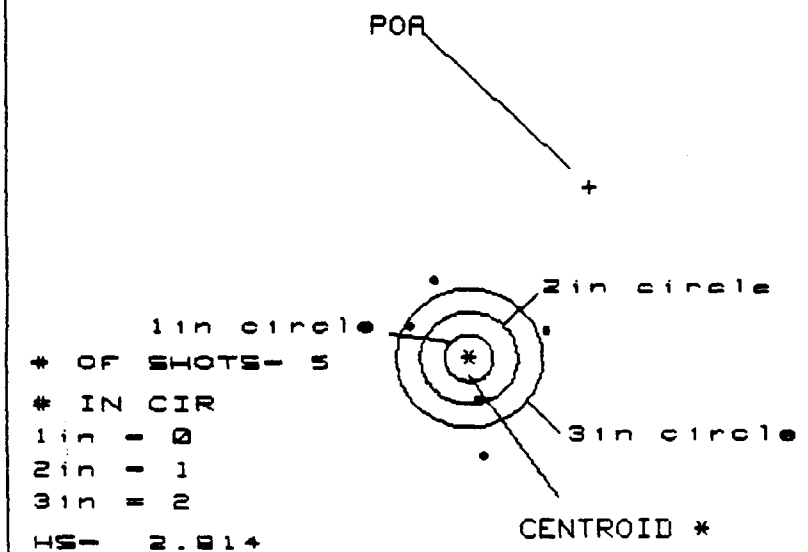


PATTERN #	:	[redacted]		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.040	.770	.430
MINIMUM X	:	-1.079	-.863	-.606
MAXIMUM Y	:	2.359	1.452	1.274
MINIMUM Y	:	-1.402	-.813	-.991
CENTROID X	:	-2.619	-2.349	-2.606
CENTROID Y	:	-1.214	-1.803	-1.625
POA TO CENTROID in.	:	2.886	2.961	3.071
MIN RADIUS	:	.824	.203	.515
MEAN RADIUS	:	1.482	.911	.977
MAX RADIUS	:	2.594	1.689	1.411
HORIZONTAL SPREAD	:	2.119	1.633	1.036
VERTICAL SPREAD	:	3.761	2.265	2.265
EXTREME SPREAD	:	4.076	2.571	2.397
NUMBER IN ONE INCH CIRCLE	=		0	
NUMBER IN TWO INCH CIRCLE	=		1	
NUMBER IN THREE INCH CIRCLE	=		3	

BOL AMBIENT

9 Oct 1986

CENTERFIRE PATTERNS # 3



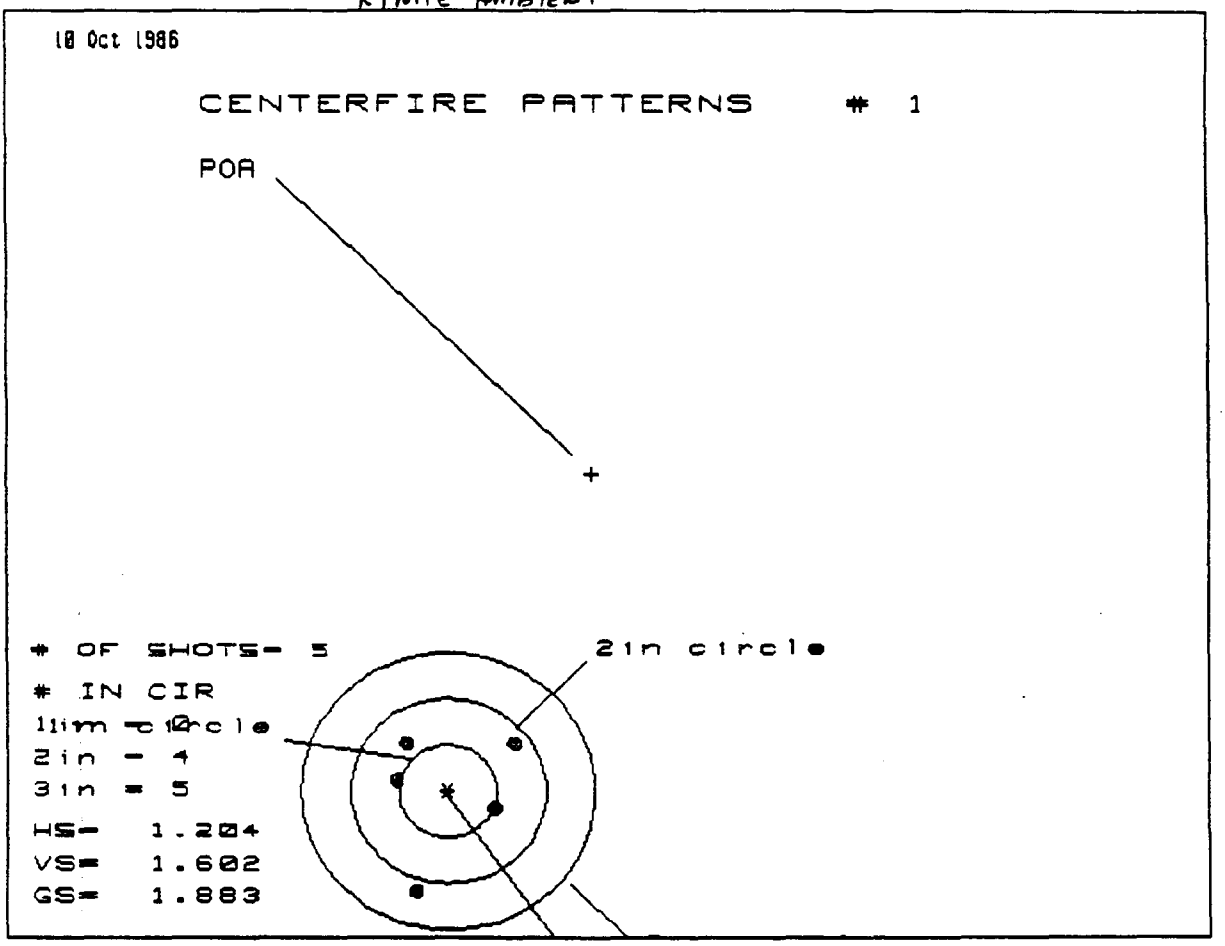
OF SHOTS= 5

# IN CIR
1in = 0
2in = 1
3in = 2

HS= 2.814
VS= 3.793
GS= 3.927

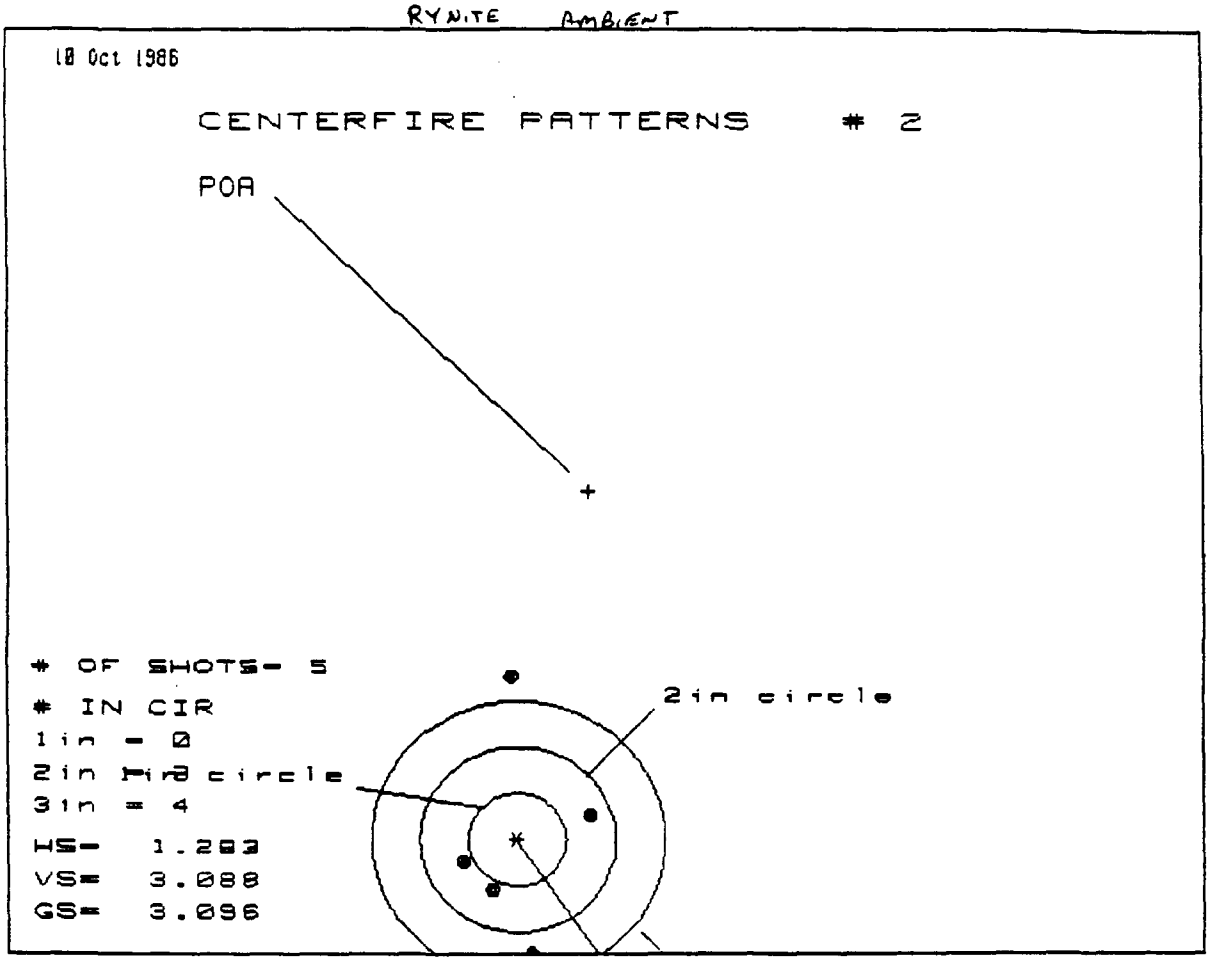
PATTERN #	:	[redacted]		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.547	1.621	1.406
MINIMUM X	:	-1.267	-1.193	-1.408
MAXIMUM Y	:	1.687	1.160	.595
MINIMUM Y	:	-2.106	-1.434	-1.047
CENTROID X	:	-2.480	-2.554	-2.339
CENTROID Y	:	-3.698	-3.171	-3.558
POA TO CENTROID in.	:	4.453	4.072	4.258
MIN RADIUS	:	.918	1.211	1.047
MEAN RADIUS	:	1.600	1.403	1.351
MAX RADIUS	:	2.127	1.623	1.529
HORIZONTAL SPREAD	:	2.814	2.814	2.814
VERTICAL SPREAD	:	3.793	2.594	1.642
EXTREME SPREAD	:	3.927	2.818	2.818
NUMBER IN ONE INCH CIRCLE	=		0	
NUMBER IN TWO INCH CIRCLE	=		1	
NUMBER IN THREE INCH CIRCLE	=		2	

RYNITE AMBIENT



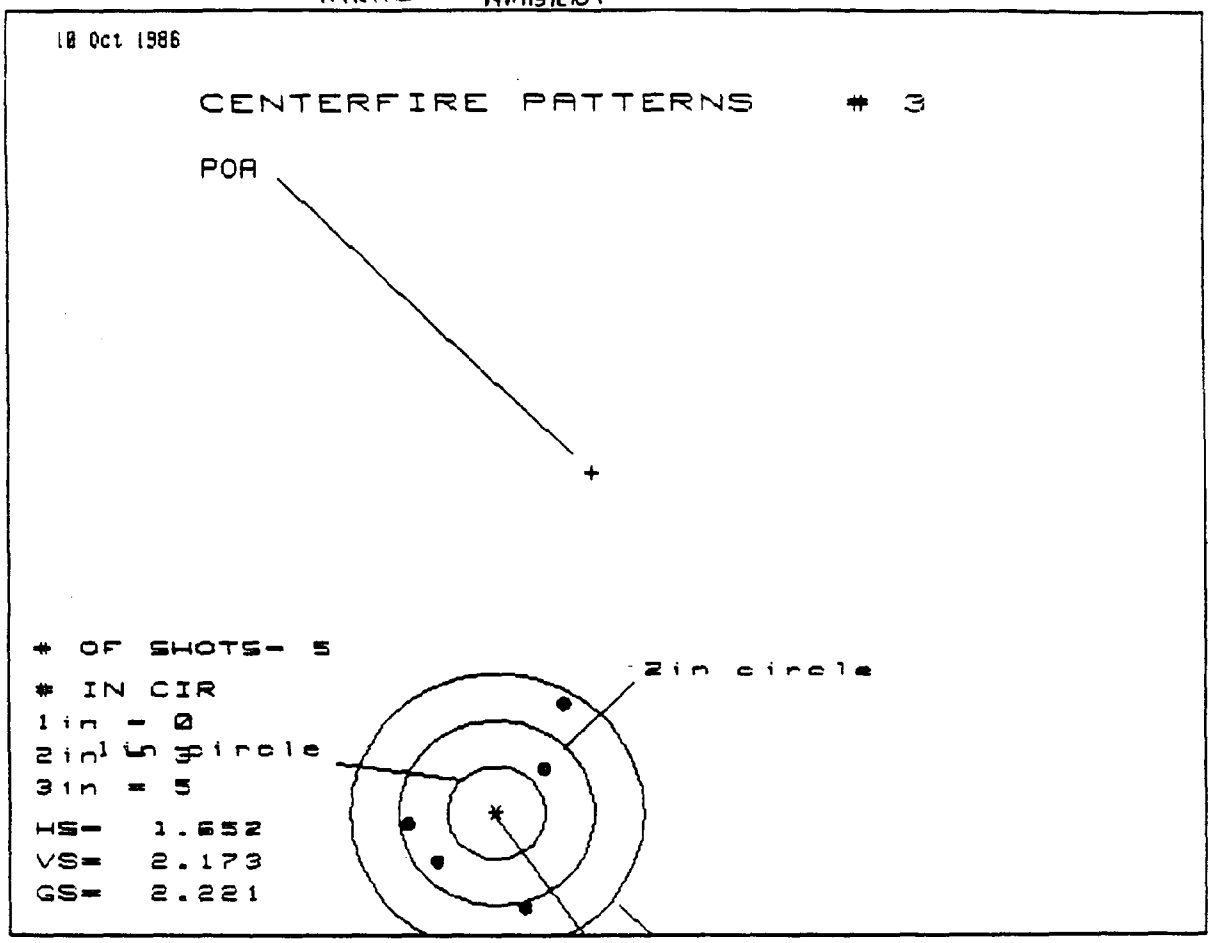
PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.710	.632	.654
MINIMUM X	:	-.494	-.572	-.361
MAXIMUM Y	:	.568	.309	.406
MINIMUM Y	:	-1.034	-.482	-.385
CENTROID X	:	-1.477	-1.399	-1.610
CENTROID Y	:	-3.419	-3.160	-3.257
POA TO CENTROID in.	:	3.724	3.456	3.633
MIN RADIUS	:	.514	.583	.361
MEAN RADIUS	:	.754	.631	.540
MAX RADIUS	:	1.080	.696	.759
HORIZONTAL SPREAD	:	1.204	1.204	1.015
VERTICAL SPREAD	:	1.602	.791	.791
EXTREME SPREAD	:	1.883	1.271	1.235
NUMBER IN ONE INCH CIRCLE	=		0	
NUMBER IN TWO INCH CIRCLE	=		4	
Three	:		5	

RYNITE AMBIENT



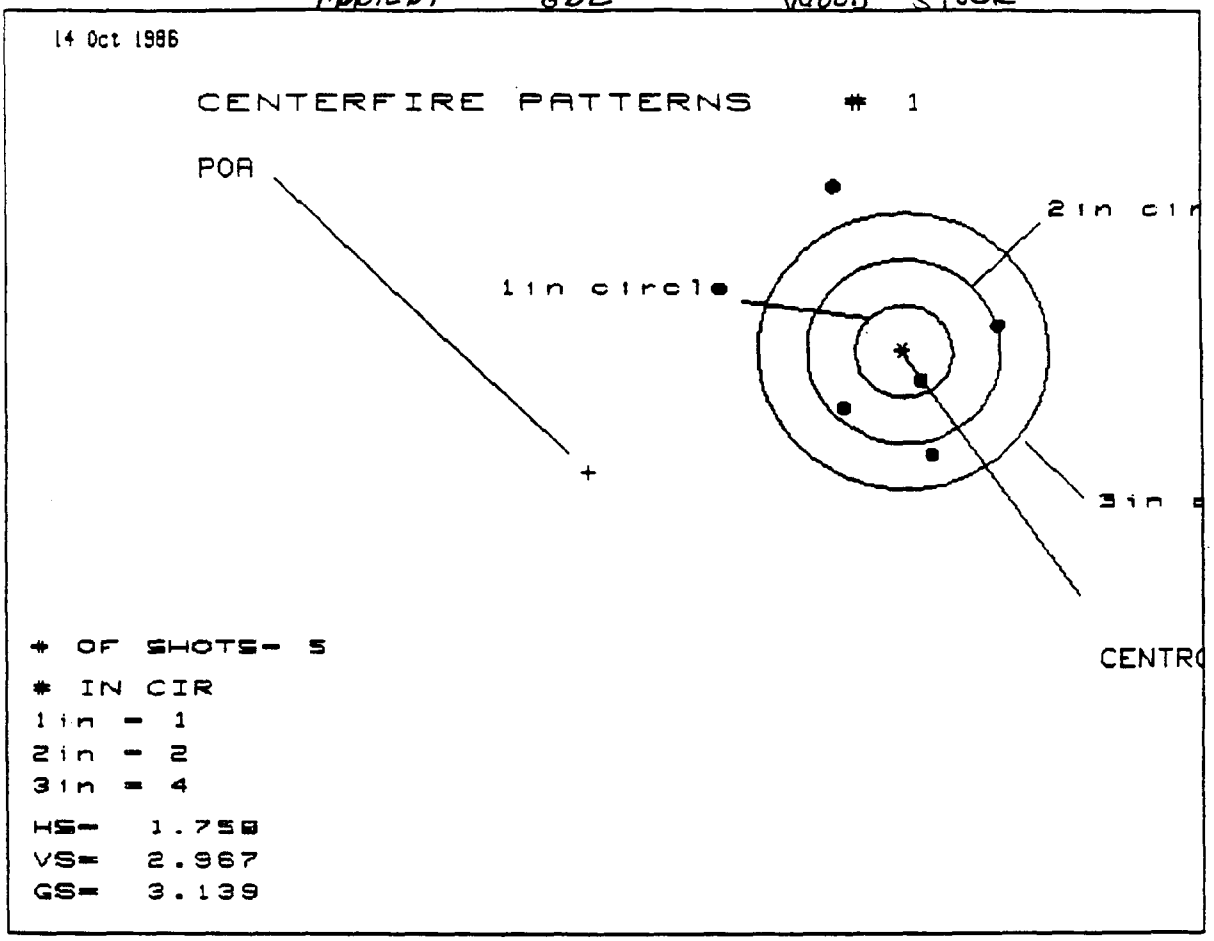
PATTERN #	:			
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.733	.714	.755
MINIMUM X	:	-.550	-.569	-.528
MAXIMUM Y	:	1.813	.677	.403
MINIMUM Y	:	-1.275	-.821	-.328
CENTROID X	:	-.740	-.721	-.762
CENTROID Y	:	-3.765	-4.219	-3.945
POA TO CENTROID in.	:	3.837	4.280	4.018
MIN RADIUS	:	.565	.273	.399
MEAN RADIUS	:	1.007	.672	.596
MAX RADIUS	:	1.815	.984	.856
HORIZONTAL SPREAD	:	1.283	1.283	1.283
VERTICAL SPREAD	:	3.088	1.498	.731
EXTREME SPREAD	:	3.096	1.611	1.369
NUMBER IN ONE INCH CIRCLE	=		0	
NUMBER IN TWO INCH CIRCLE	=		3	
NUMBER IN THREE INCH CIRCLE	=		4	

RYNITE AMBIENT



PATTERN #	:	■		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.728	.706	.856
MINIMUM X	:	-.924	-.742	-.592
MAXIMUM Y	:	1.160	.793	.552
MINIMUM Y	:	-1.013	-.723	-.454
CENTROID X	:	-.989	-1.171	-1.321
CENTROID Y	:	-3.681	-3.971	-3.730
POA TO CENTROID in.	:	3.811	4.140	3.957
MIN RADIUS	:	.727	.466	.526
MEAN RADIUS	:	.972	.784	.715
MAX RADIUS	:	1.370	1.062	1.019
HORIZONTAL SPREAD	:	1.652	1.448	1.448
VERTICAL SPREAD	:	2.173	1.516	1.006
EXTREME SPREAD	:	2.221	1.587	1.587
NUMBER IN ONE INCH CIRCLE	=		0	
NUMBER IN TWO INCH CIRCLE	=		3	
NUMBER IN THREE INCH CIRCLE	=		5	

AMBIENT BDL WOOD STOCK

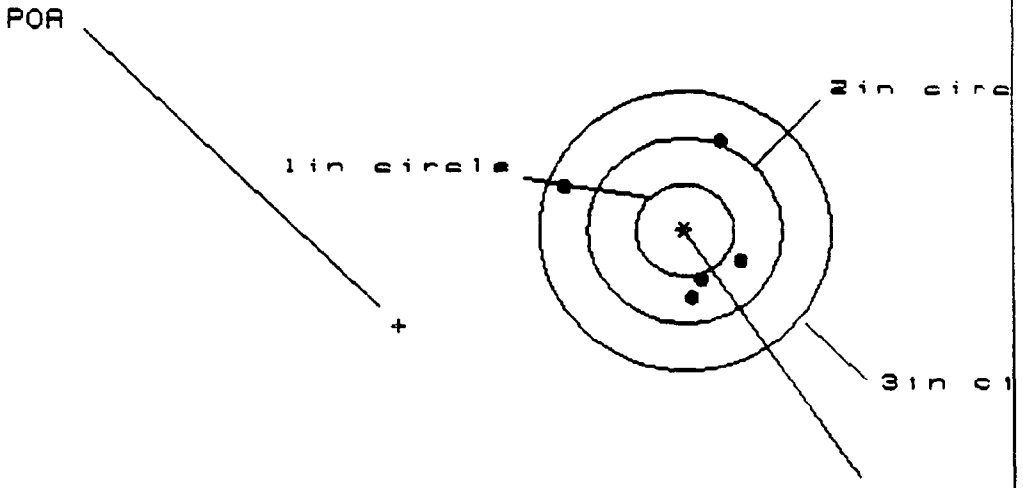


PATTERN #	:	[redacted]		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.000	.811	.837
MINIMUM X	:	-.758	-.842	-.816
MAXIMUM Y	:	1.828	.728	.501
MINIMUM Y	:	-1.139	-.682	-.413
CENTROID X	:	3.229	3.418	3.392
CENTROID Y	:	1.316	.859	1.086
POA TO CENTROID in.	:	3.487	3.525	3.562
MIN RADIUS	:	.348	.148	.090
MEAN RADIUS	:	1.090	.697	.660
MAX RADIUS	:	1.979	1.089	.975
HORIZONTAL SPREAD	:	1.758	1.653	1.653
VERTICAL SPREAD	:	2.967	1.410	.914
EXTREME SPREAD	:	3.139	1.889	1.889
NUMBER IN ONE INCH CIRCLE	=		1	
NUMBER IN TWO INCH CIRCLE	=		2	
NUMBER IN THREE INCH CIRCLE	=		4	

AMBIENT BDL

14 Oct 1986

CENTERFIRE PATTERNS # 2



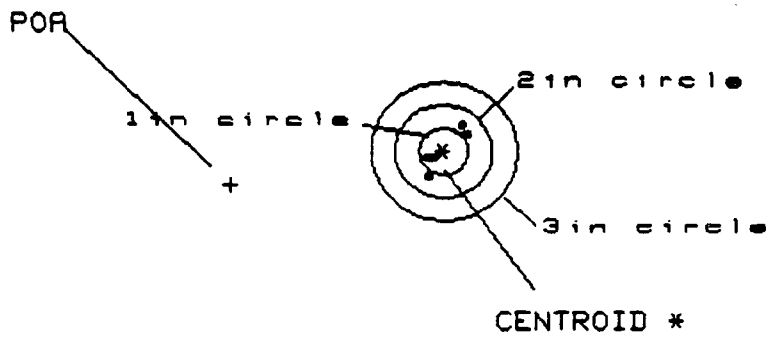
# OF SHOTS= 5
# IN CIR
1in = 0
2in = 3
3in = 5
HS= 1.841
VS= 1.691
GS= 2.037

PATTERN #	:	[redacted]		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.601	.291	.314
MINIMUM X	:	-1.240	-.243	-.220
MAXIMUM Y	:	1.016	1.144	.152
MINIMUM Y	:	-.675	-.547	-.165
CENTROID X	:	2.937	3.247	3.224
CENTROID Y	:	1.024	.896	.514
POA TO CENTROID in.	:	3.110	3.368	3.265
MIN RADIUS	:	.533	.371	.094
MEAN RADIUS	:	.867	.625	.239
MAX RADIUS	:	1.342	1.146	.348
HORIZONTAL SPREAD	:	1.841	.534	.534
VERTICAL SPREAD	:	1.691	1.691	.317
EXTREME SPREAD	:	2.037	1.719	.621
NUMBER IN ONE INCH CIRCLE	=		0	
NUMBER IN TWO INCH CIRCLE	=		3	
NUMBER IN THREE INCH CIRCLE	=		5	

AMBIENT BDL

14 Oct 1986

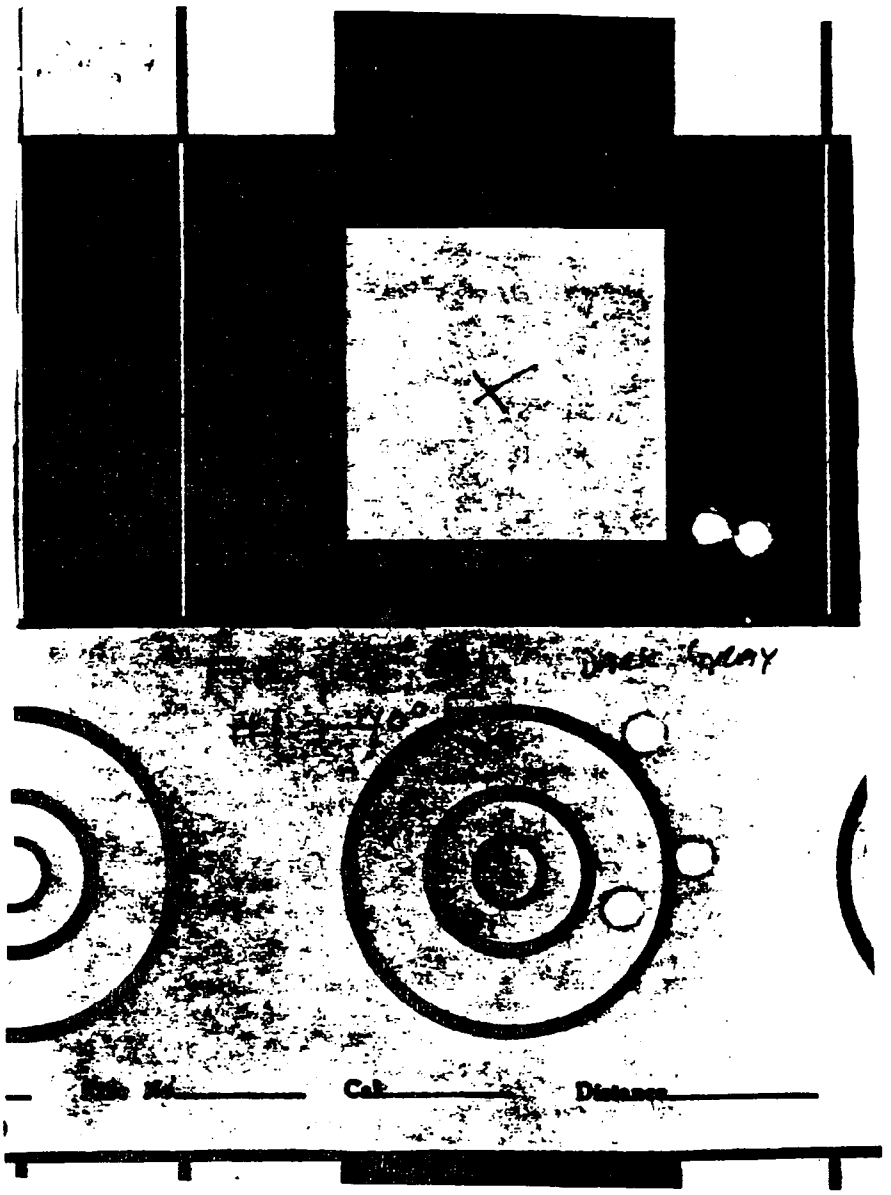
CENTERFIRE PATTERNS # 3

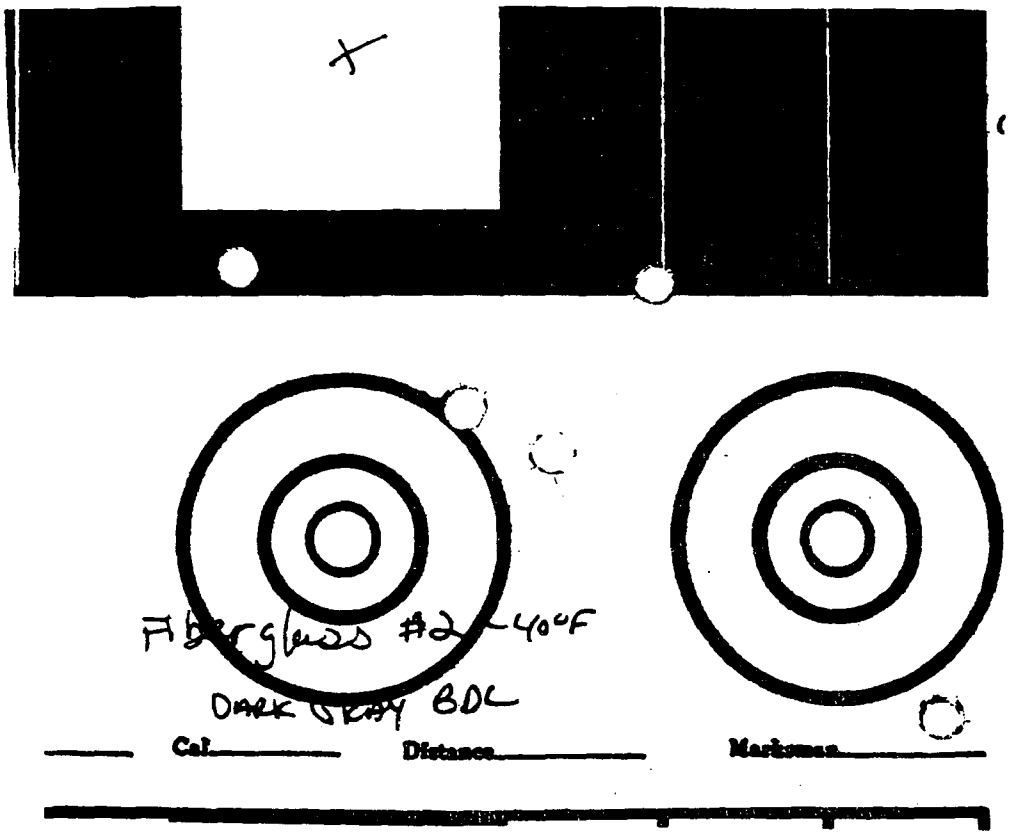


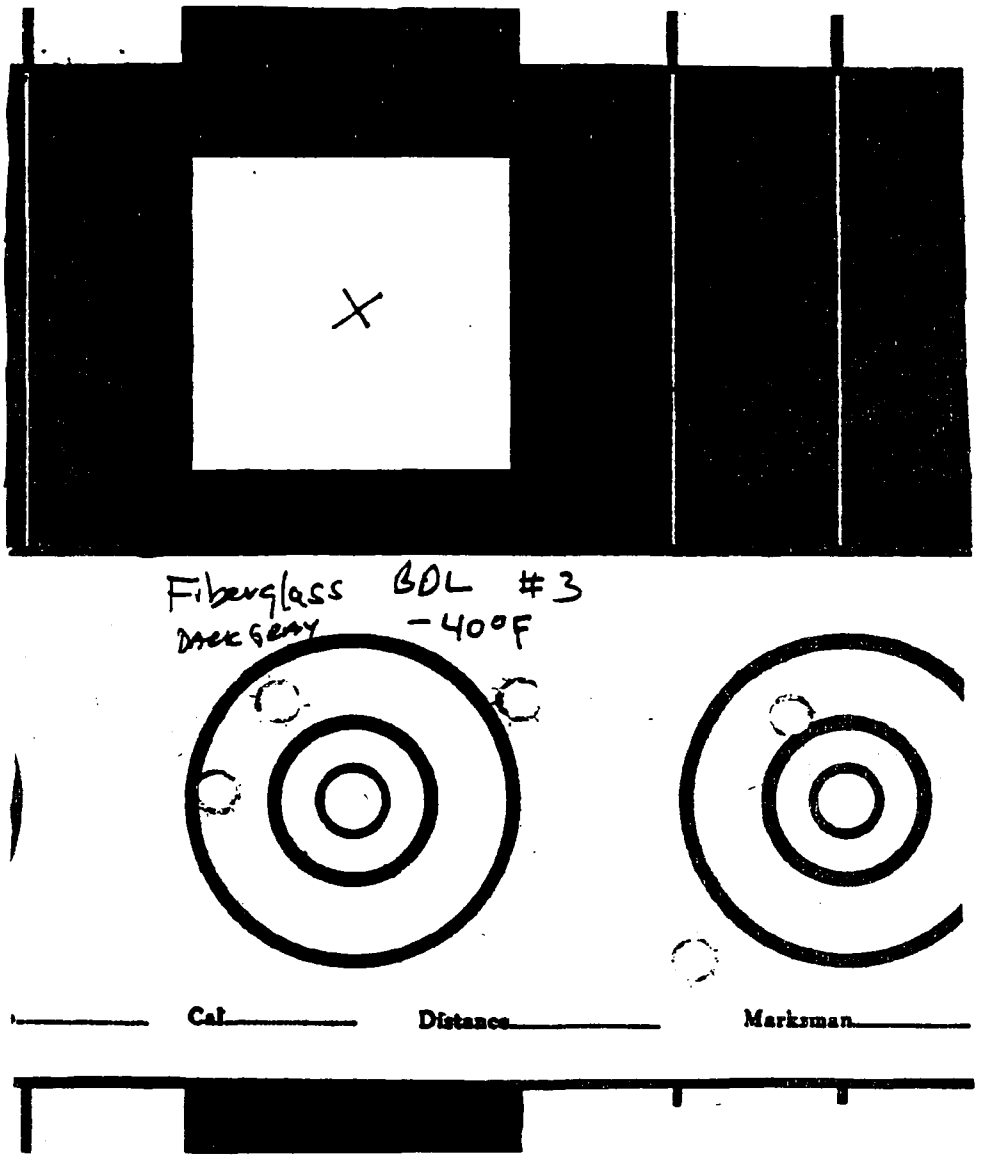
# OF SHOTS= 5
# IN CIR
1in = 2
2in = 5
3in = 5
HS= .820
VS= 1.154
GS= 1.308

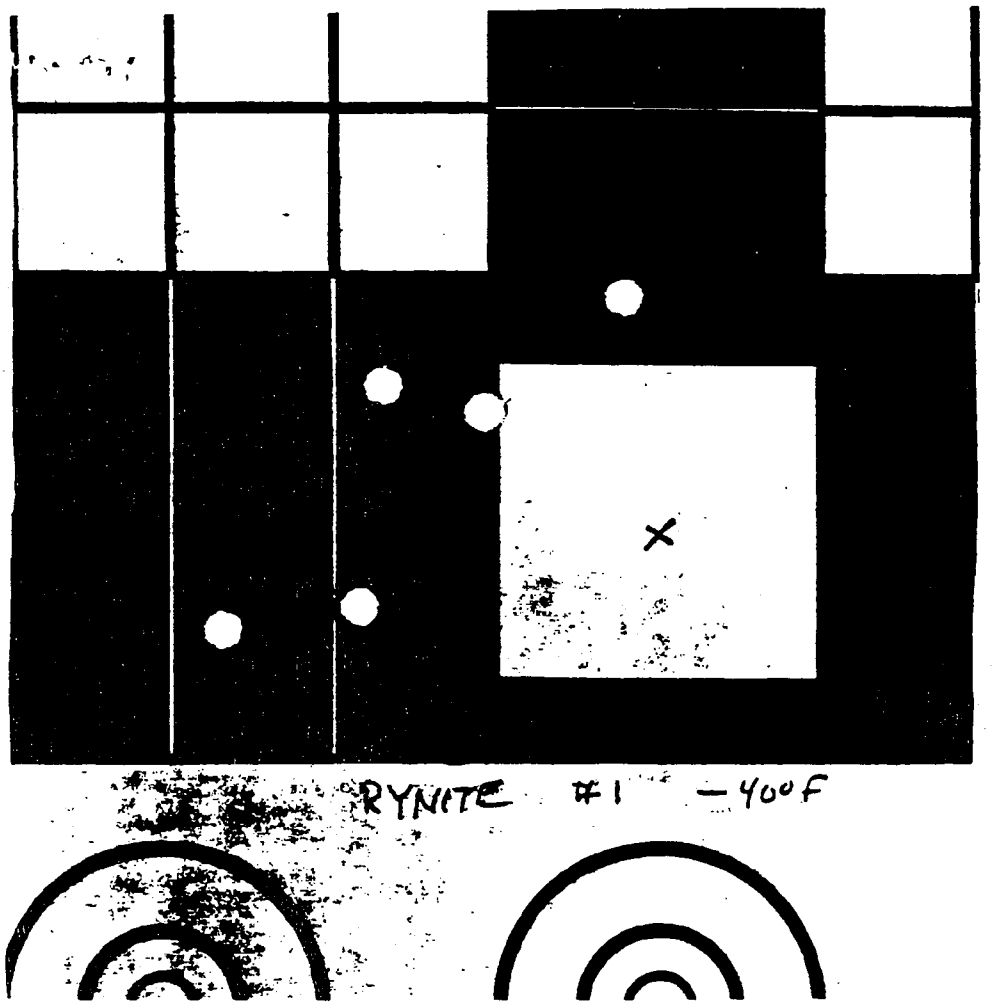
PATTERN # : [redacted]

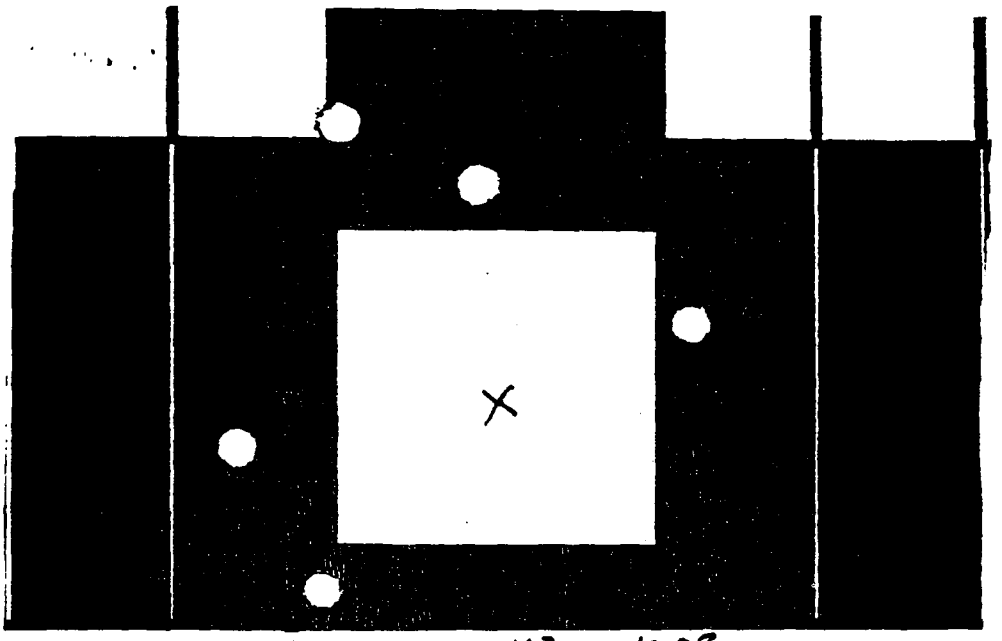
SHOTS (BEST OF)	5	4	3
MAXIMUM X	.512	.595	.527
MINIMUM X	-.308	-.225	-.293
MAXIMUM Y	.576	.490	.345
MINIMUM Y	-.578	-.434	-.176
CENTROID X	4.422	4.339	4.407
CENTROID Y	.731	.587	.732
POA TO CENTROID in.	4.482	4.379	4.467
MIN RADIUS	.305	.170	.293
MEAN RADIUS	.517	.412	.421
MAX RADIUS	.664	.771	.630
HORIZONTAL SPREAD	.820	.820	.820
VERTICAL SPREAD	1.154	.924	.521
EXTREME SPREAD	1.308	1.220	.968
NUMBER IN ONE INCH CIRCLE =		2	
NUMBER IN TWO INCH CIRCLE =		5	
NUMBER IN THREE INCH CIRCLE =		5	

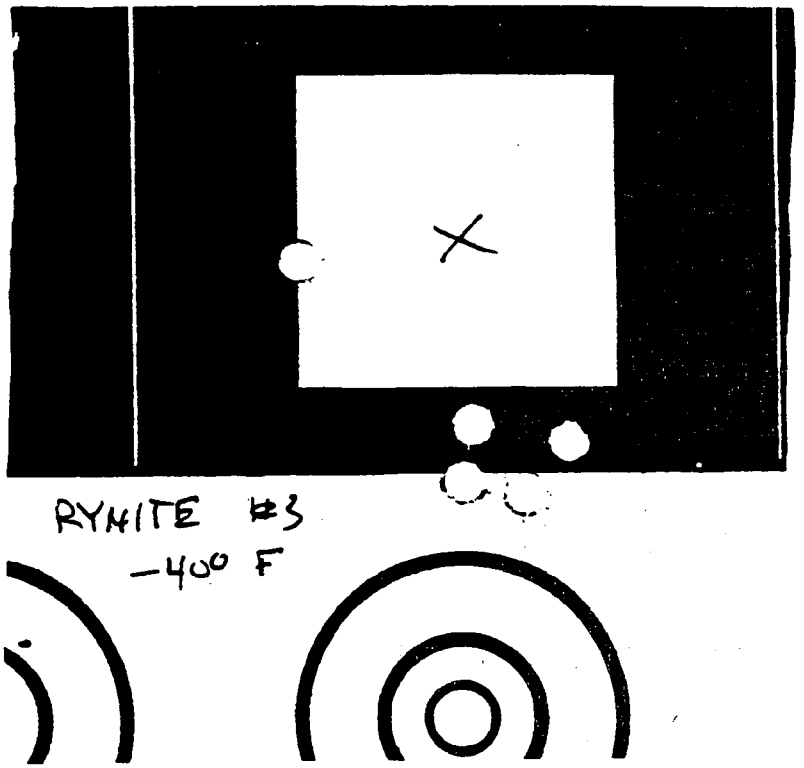


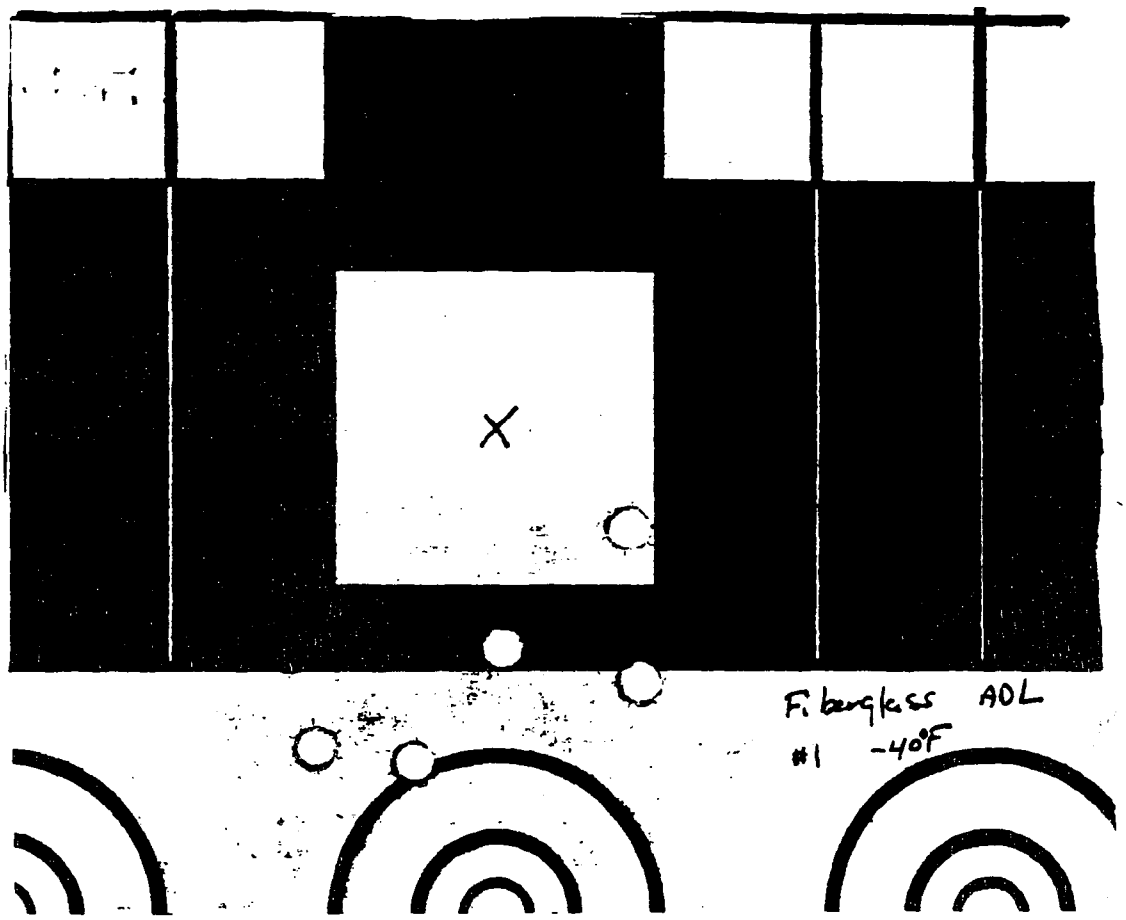

Fiberglass #2 40°F
DARK GRAY BDC
Cal.
Distance
Marksman

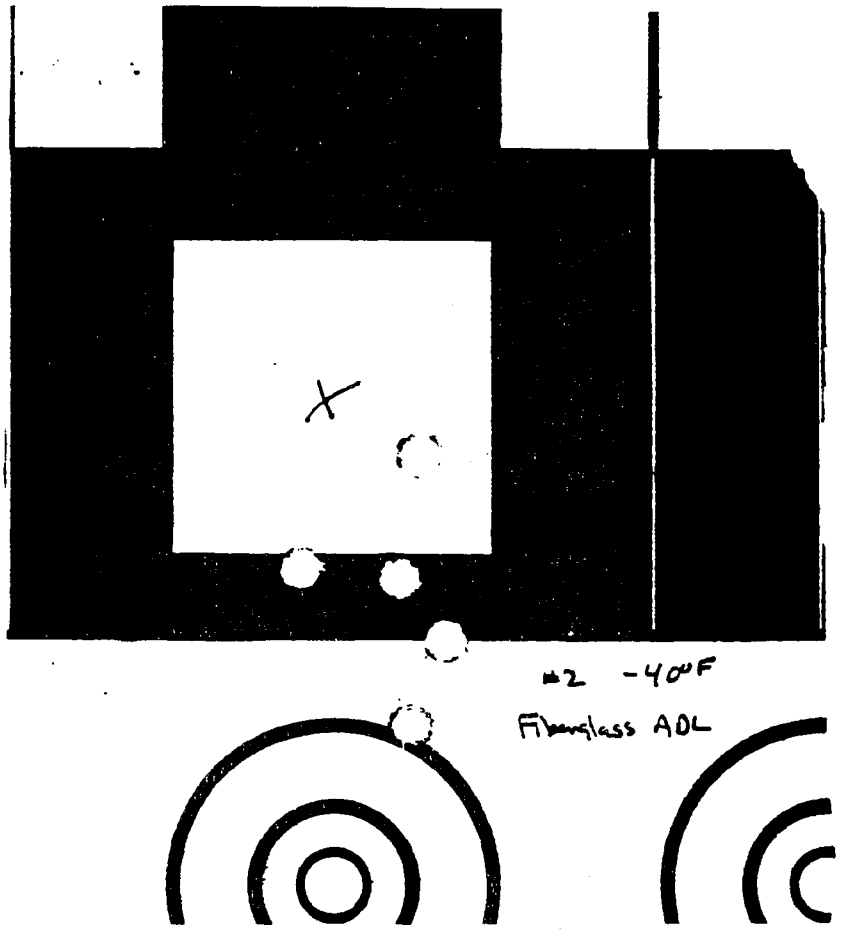

Fiberglass BDL #3
Dark Gray -40°F
Cal.
Distance
Marksman

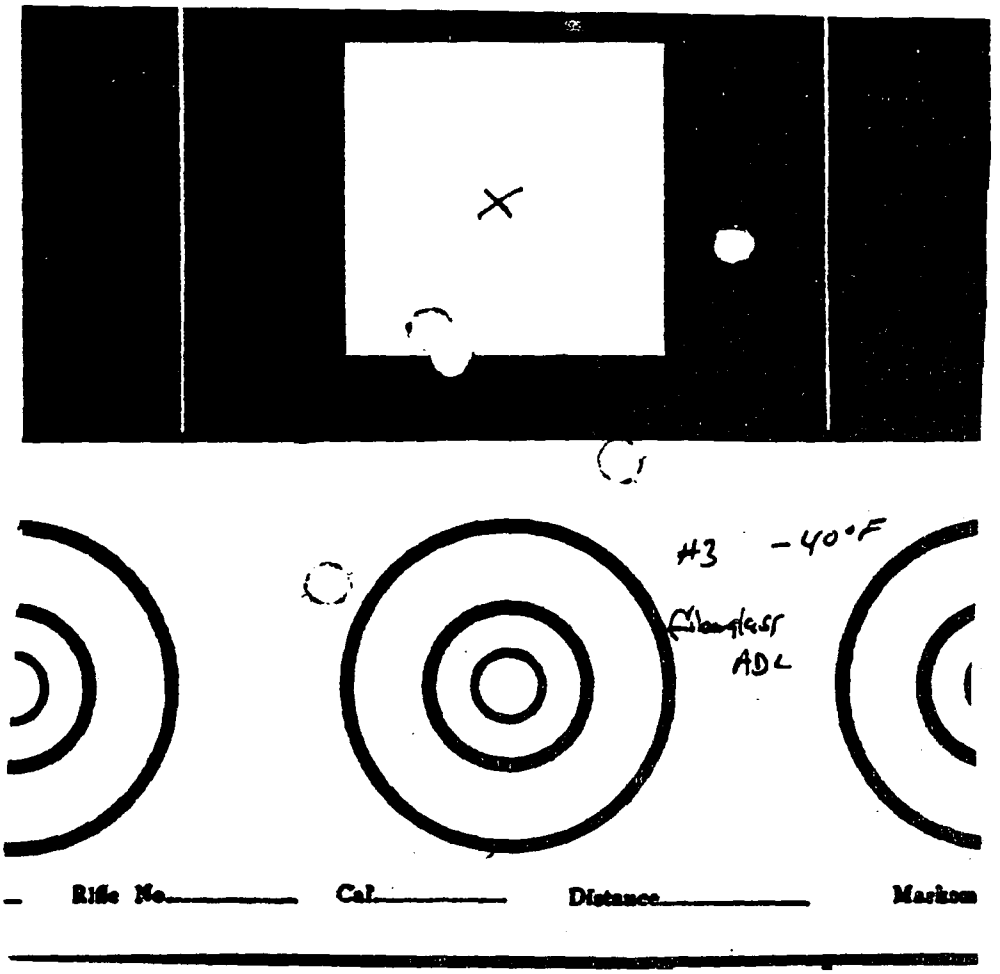

RYNITE #1 —400F

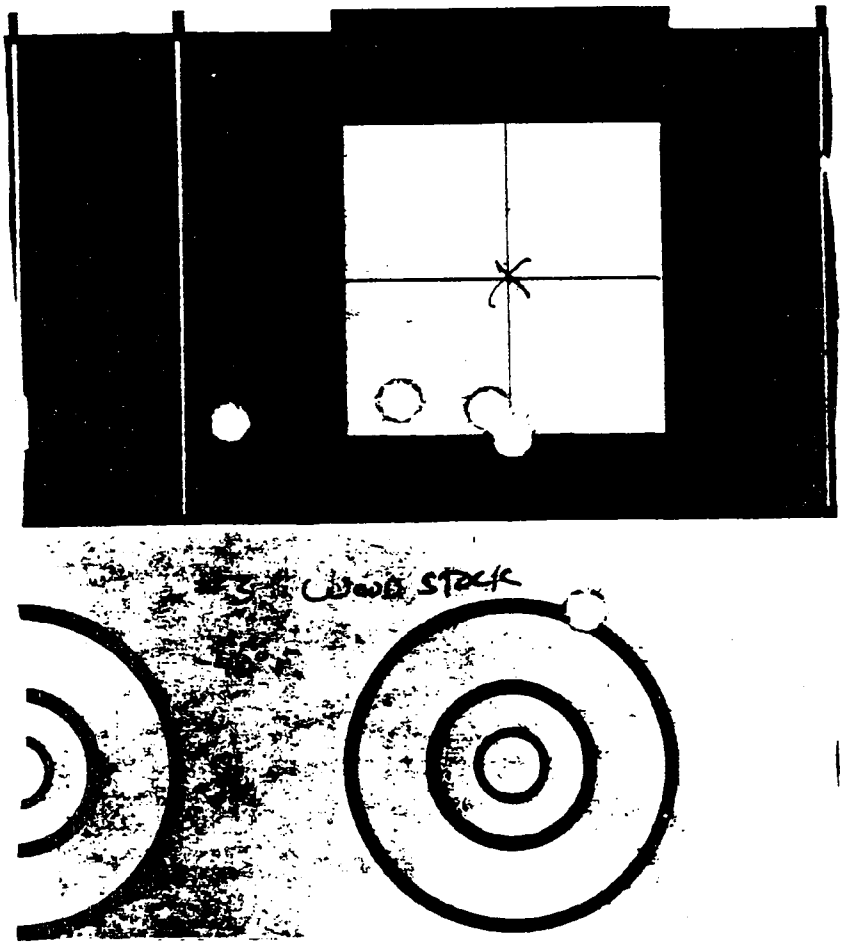

RYNITE #2 -40°F

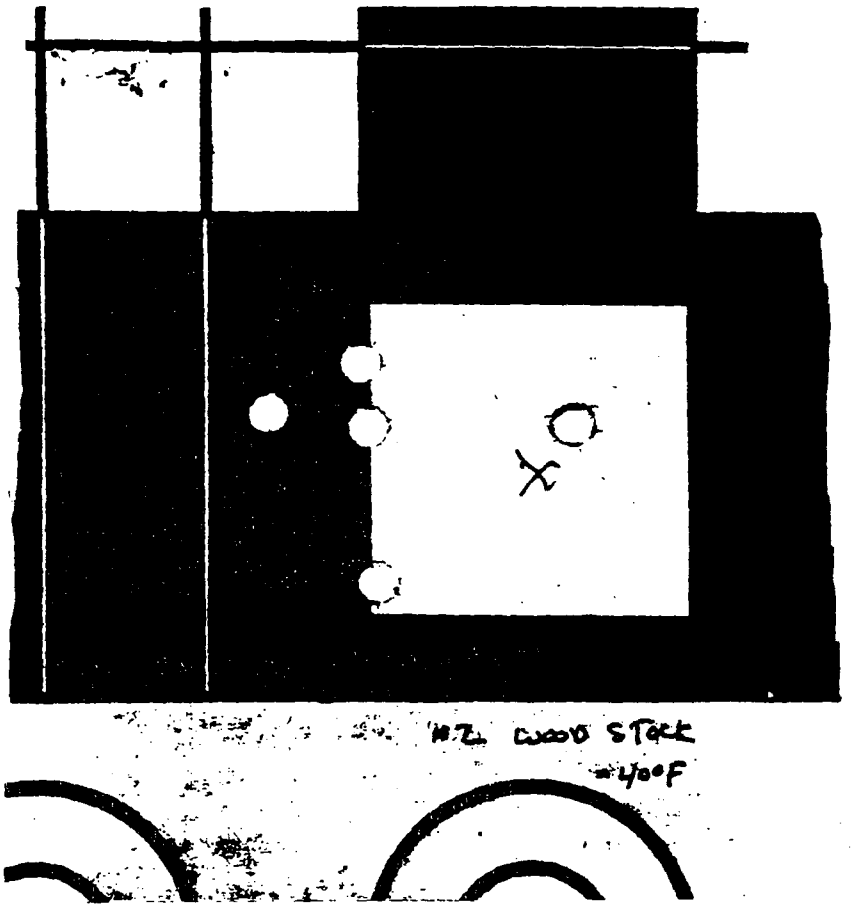

RYHITE #3
-400 F


Fiberglass AOL
#1 -40°F


#2 -40°F
Fiberglass ADL


#3 -40°F
ADL
Rifle No.
Cal.
Distance
Marksm




WOOD STACK
400F

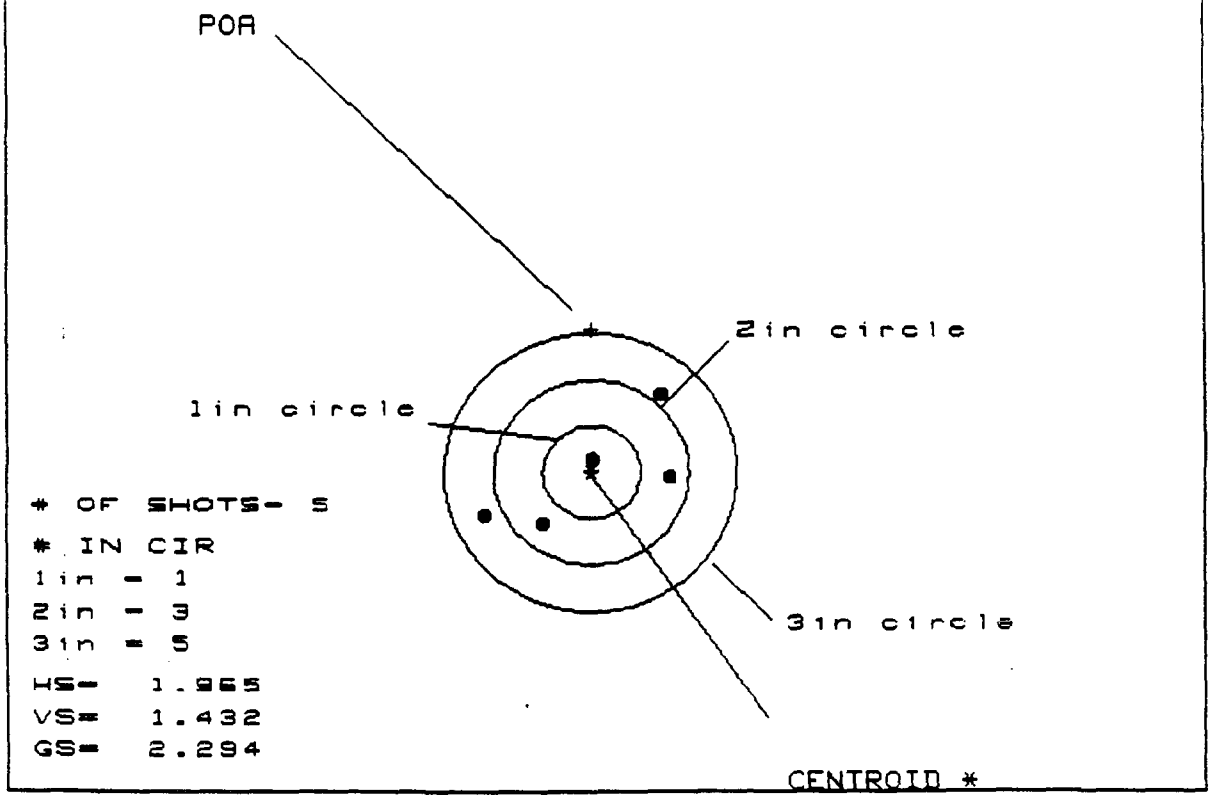
No.
Cal.
Distance
Marksman
1st
wood stock.
4th - 40' F

AFTER -40° F

B & C ADL.

21 Oct 1986

CENTERFIRE PATTERNS # 1



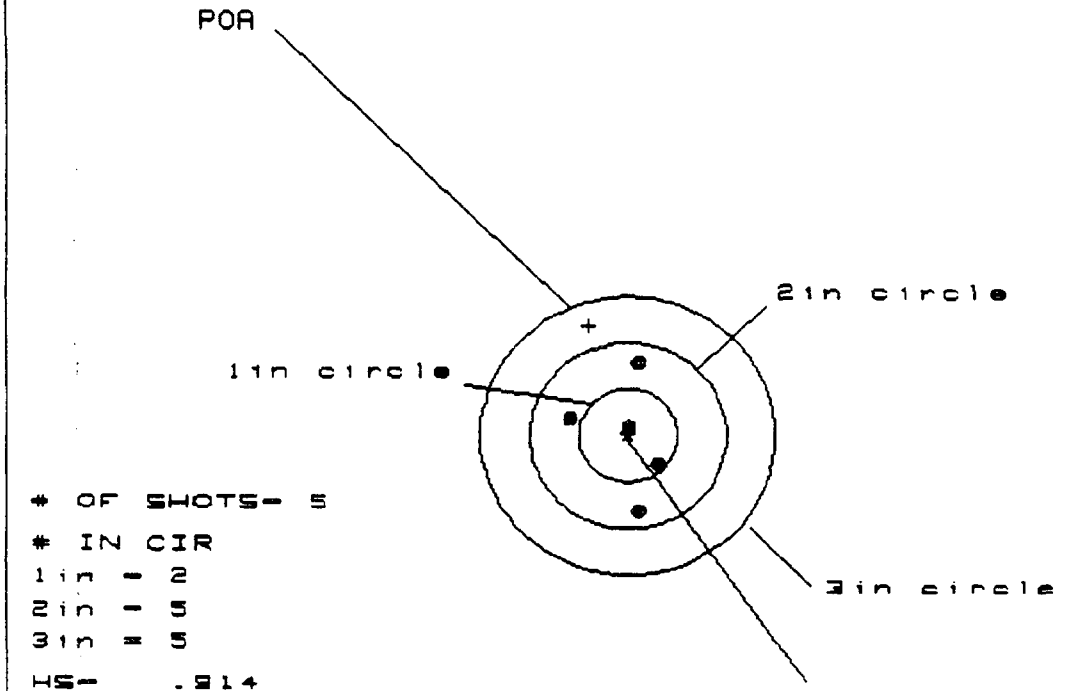
# OF SHOTS= 5
# IN CIR
1in = 1
2in = 3
3in = 5
HS= 1.965
VS= 1.432
GS= 2.294

PATTERN #	:	1		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.849	.570	.728
MINIMUM X	:	-1.116	-.807	-.649
MAXIMUM Y	:	.883	.772	.322
MINIMUM Y	:	-.549	-.660	-.403
CENTROID X	:	-.006	.273	.115
CENTROID Y	:	-1.547	-1.436	-1.693
POA TO CENTROID in.	:	1.547	1.462	1.697
MIN RADIUS	:	.181	.245	.332
MEAN RADIUS	:	.831	.698	.689
MAX.RADIUS	:	1.202	1.043	.764
HORIZONTAL SPREAD	:	1.965	1.377	1.377
VERTICAL SPREAD	:	1.432	1.432	.725
EXTREME SPREAD	:	2.294	1.922	1.459
NUMBER IN ONE INCH CIRCLE	=		1	
NUMBER IN TWO INCH CIRCLE	=		3	
NUMBER IN THREE INCH CIRCLE	=		5	

AFTER -40°F B&C ADL

21 Oct 1986

CENTERFIRE PATTERNS # 2



# OF SHOTS= 5
# IN CIR
1in = 2
2in = 5
3in = 5
HS= .914
VS= 1.598
GS= 1.599

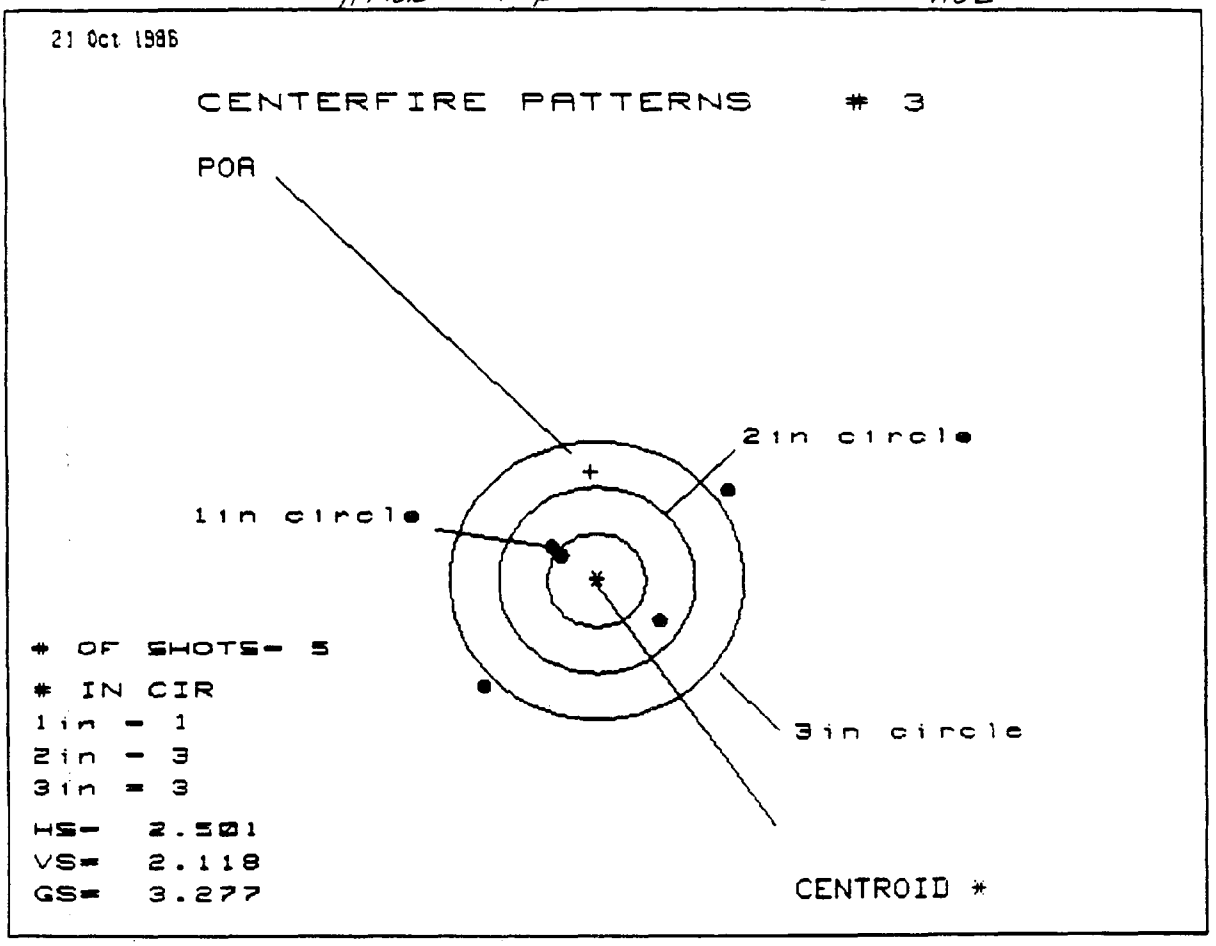
PATTERN # : [redacted]

SHOTS (BEST OF)	5	4	3
MAXIMUM X	.316	.352	.396
MINIMUM X	-.598	-.561	-.518
MAXIMUM Y	.805	.342	.145
MINIMUM Y	-.793	-.592	-.265
CENTROID X	.395	.358	.315
CENTROID Y	-1.188	-1.389	-1.192
POA TO CENTROID in.	1.252	1.435	1.233
MIN RADIUS	.124	.328	.172
MEAN RADIUS	.554	.488	.396
MAX RADIUS	.818	.657	.538
HORIZONTAL SPREAD	.914	.914	.914
VERTICAL SPREAD	1.598	.934	.410
EXTREME SPREAD	1.599	1.162	1.002
NUMBER IN ONE INCH CIRCLE =		2	
NUMBER IN TWO INCH CIRCLE =		5	
NUMBER IN THREE INCH CIRCLE =		5	

AFTER -40°F B&C AOL

21 Oct 1986

CENTERFIRE PATTERNS # 3



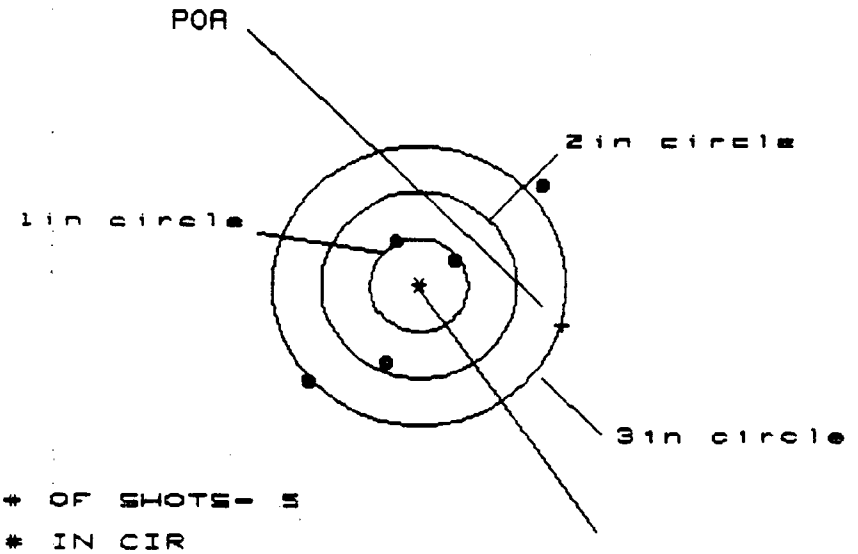
# OF SHOTS= 5
# IN CIR
1in = 1
2in = 3
3in = 3
HS= 2.501
VS= 2.118
GS= 3.277

PATTERN #	:	[redacted]		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.364	.976	.711
MINIMUM X	:	-1.137	-.796	-.417
MAXIMUM Y	:	.951	.636	.326
MINIMUM Y	:	-1.167	-.930	-.481
CENTROID X	:	.059	-.283	-.017
CENTROID Y	:	-1.168	-1.405	-1.095
POA TO CENTROID in.	:	1.169	1.433	1.095
MIN RADIUS	:	.434	.465	.333
MEAN RADIUS	:	1.023	.834	.573
MAX RADIUS	:	1.663	1.224	.859
HORIZONTAL SPREAD	:	2.501	1.772	1.128
VERTICAL SPREAD	:	2.118	1.566	.807
EXTREME SPREAD	:	3.277	1.928	1.387
NUMBER IN ONE INCH CIRCLE	=		1	
NUMBER IN TWO INCH CIRCLE	=		3	
NUMBER IN THREE INCH CIRCLE	=		3	

After - 40°F RYNITE.

21 Oct 1986

CENTERFIRE PATTERNS # 4



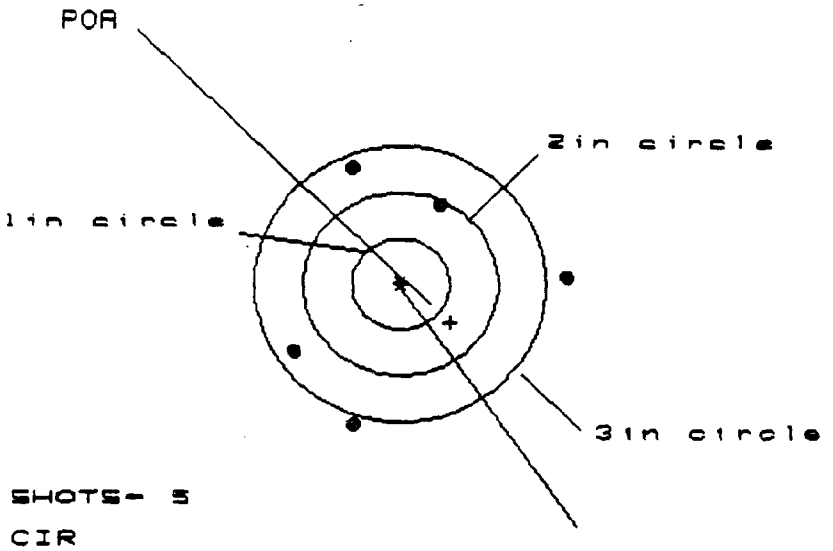
# OF SHOTS= 5
# IN CIR
1in = 0
2in = 3
3in = 3
HS= 2.369
VS= 2.047
GS= 3.131

PATTERN #	:	4		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.243	.709	.437
MINIMUM X	:	-1.126	-.815	-.284
MAXIMUM Y	:	1.049	.747	.502
MINIMUM Y	:	-.998	-.736	-.837
CENTROID X	:	-1.462	-1.773	-1.501
CENTROID Y	:	.428	.166	.411
POA TO CENTROID in.	:	1.523	1.781	1.556
MIN RADIUS	:	.510	.592	.524
MEAN RADIUS	:	1.015	.841	.653
MAX RADIUS	:	1.626	1.098	.884
HORIZONTAL SPREAD	:	2.369	1.524	.721
VERTICAL SPREAD	:	2.047	1.483	1.339
EXTREME SPREAD	:	3.131	2.014	1.377
NUMBER IN ONE INCH CIRCLE	=		0	
NUMBER IN TWO INCH CIRCLE	=		3	
NUMBER IN THREE INCH CIRCLE	=		3	

HRICH -40°F RYNITE

21 Oct 1986

CENTERFIRE PATTERNS # 5



# OF SHOTS= 5
# IN CIR
1in = 0
2in = 1
3in = 3
HS= 2.768
VS= 2.867
GS= 2.877

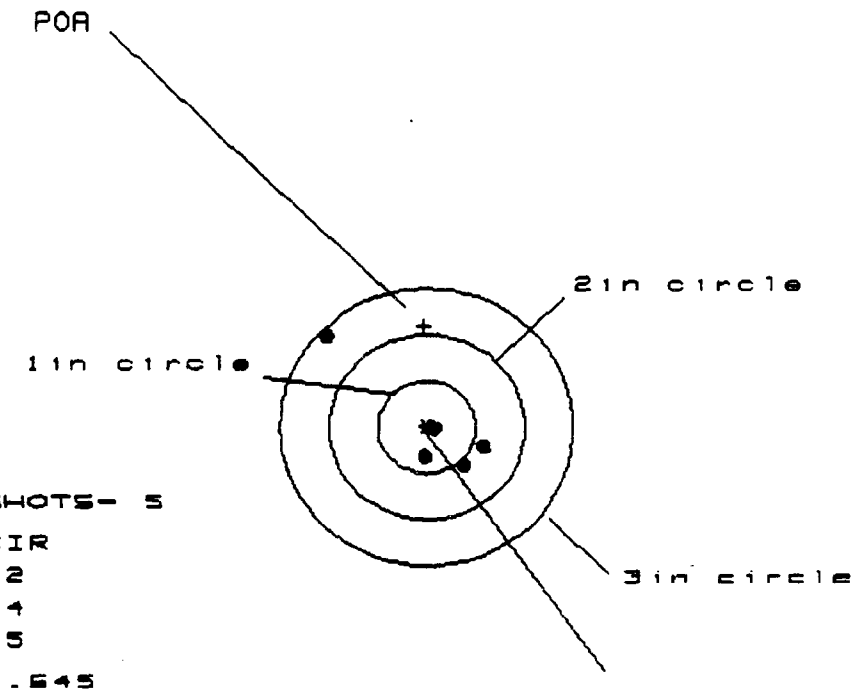
PATTERN #	:	[redacted]		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.688	.801	.764
MINIMUM X	:	-1.080	-.658	-.695
MAXIMUM Y	:	1.299	1.318	.802
MINIMUM Y	:	-1.568	-1.549	-1.204
CENTROID X	:	-.508	-.930	-.893
CENTROID Y	:	.428	.409	.925
POA TO CENTROID in.	:	.664	1.016	1.286
MIN RADIUS	:	.977	.952	.805
MEAN RADIUS	:	1.398	1.261	1.020
MAX RADIUS	:	1.690	1.553	1.390
HORIZONTAL SPREAD	:	2.768	1.459	1.459
VERTICAL SPREAD	:	2.867	2.867	2.006

EXTREME SPREAD	:	2.877	2.868	2.171
NUMBER IN ONE INCH CIRCLE	=		0	
NUMBER IN TWO INCH CIRCLE	=		1	
NUMBER IN THREE INCH CIRCLE	=		3	

AFTER -40°F RYNITE

21 Oct 1986

CENTERFIRE PATTERNS # 6



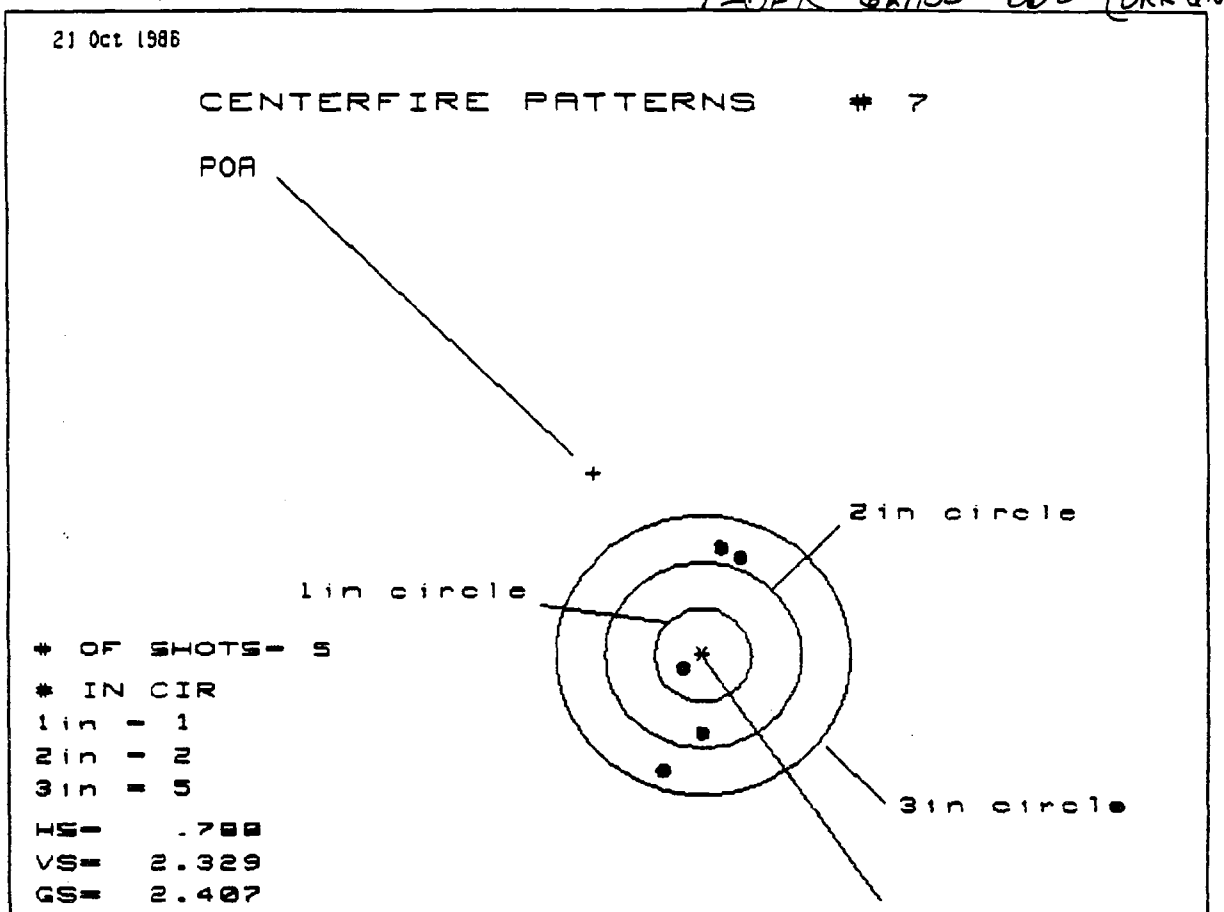
# OF SHOTS= 5
# IN CIR
1in = 2
2in = 4
3in = 5
HS= 1.645
VS= 1.394
GS= 1.990

PATTERN #	:	[redacted]		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.627	.373	.209
MINIMUM X	:	-1.018	-.259	-.135
MAXIMUM Y	:	.958	.228	.254
MINIMUM Y	:	-.436	-.196	-.170
CENTROID X	:	.022	.276	.152
CENTROID Y	:	-1.093	-1.333	-1.359
POA TO CENTROID in.	:	1.094	1.361	1.367
MIN RADIUS	:	.057	.214	.159
MEAN RADIUS	:	.601	.295	.231
MAX RADIUS	:	1.398	.381	.269
HORIZONTAL SPREAD	:	1.645	.632	.344
VERTICAL SPREAD	:	1.394	.424	.424
EXTREME SPREAD	:	1.990	.659	.510
NUMBER IN ONE INCH CIRCLE	=		2	
NUMBER IN TWO INCH CIRCLE	=		4	
NUMBER IN THREE INCH CIRCLE	=		5	

AFTER -40°F FIBER GLASS - BDL (DRK GRAY)

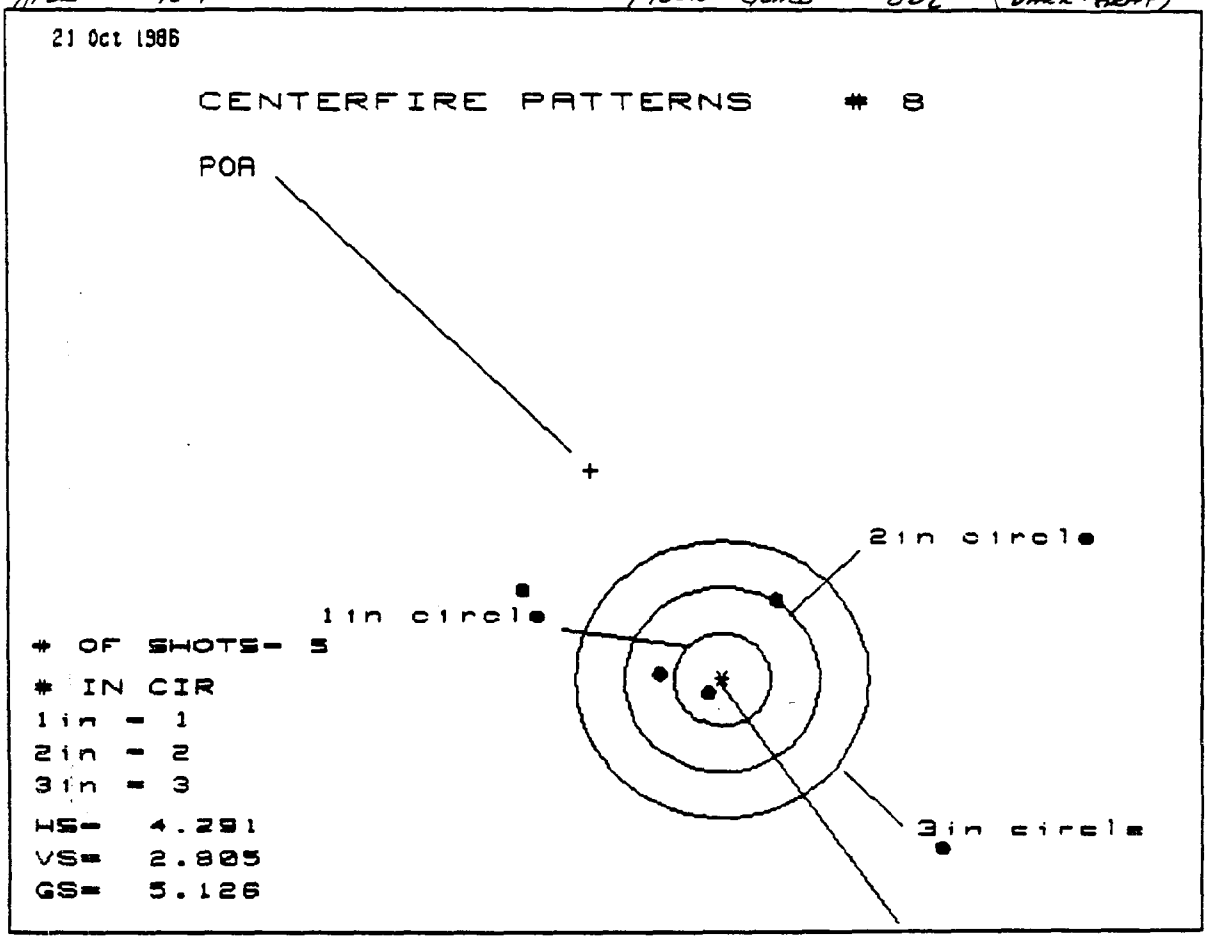
21 Oct 1986

CENTERFIRE PATTERNS # 7



PATTERN #	:	[redacted]		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.416	.323	.173
MINIMUM X	:	-.372	-.332	-.225
MAXIMUM Y	:	1.137	.838	1.100
MINIMUM Y	:	-1.192	-1.181	-.919
CENTROID X	:	1.111	1.204	1.097
CENTROID Y	:	-1.961	-1.662	-1.924
POA TO CENTROID in.	:	2.254	2.053	2.214
MIN RADIUS	:	.279	.553	.288
MEAN RADIUS	:	.944	.856	.774
MAX RADIUS	:	1.249	1.182	1.113
HORIZONTAL SPREAD	:	.788	.655	.398
VERTICAL SPREAD	:	2.329	2.019	2.019
EXTREME SPREAD	:	2.407	2.023	2.023
NUMBER IN ONE INCH CIRCLE	=		1	
NUMBER IN TWO INCH CIRCLE	=		2	
NUMBER IN THREE INCH CIRCLE	=		5	

AFDL - 40°F FIBER GLASS - BOL (DARK GRAY)



PATTERN #	:	[redacted]		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	2.273	1.082	.599
MINIMUM X	:	-2.018	-1.450	-.571
MAXIMUM Y	:	.998	.547	.609
MINIMUM Y	:	-1.807	-.622	-.440
CENTROID X	:	1.345	.777	1.260
CENTROID Y	:	-2.263	-1.812	-1.994
POA TO CENTROID in.	:	2.633	1.971	2.359
MIN RADIUS	:	.205	.362	.441
MEAN RADIUS	:	1.408	.961	.630
MAX RADIUS	:	2.904	1.549	.854
HORIZONTAL SPREAD	:	4.291	2.532	1.170
VERTICAL SPREAD	:	2.805	1.169	1.049
EXTREME SPREAD	:	5.126	2.535	1.405
NUMBER IN ONE INCH CIRCLE	=		1	
NUMBER IN TWO INCH CIRCLE	=		2	
NUMBER IN THREE INCH CIRCLE	=		3	

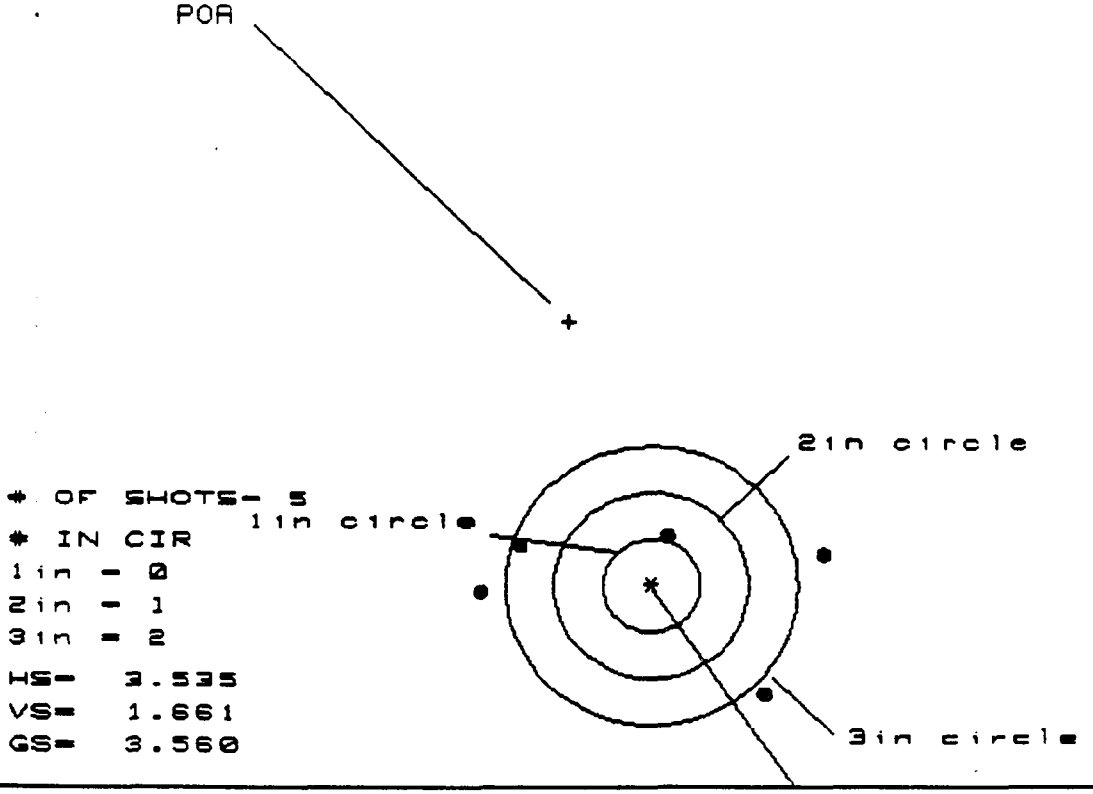
AFTER -40°F

FIBER GLASS - BDL (DARK GRAY)

21 Oct 1986

CENTERFIRE PATTERNS # 9

POA



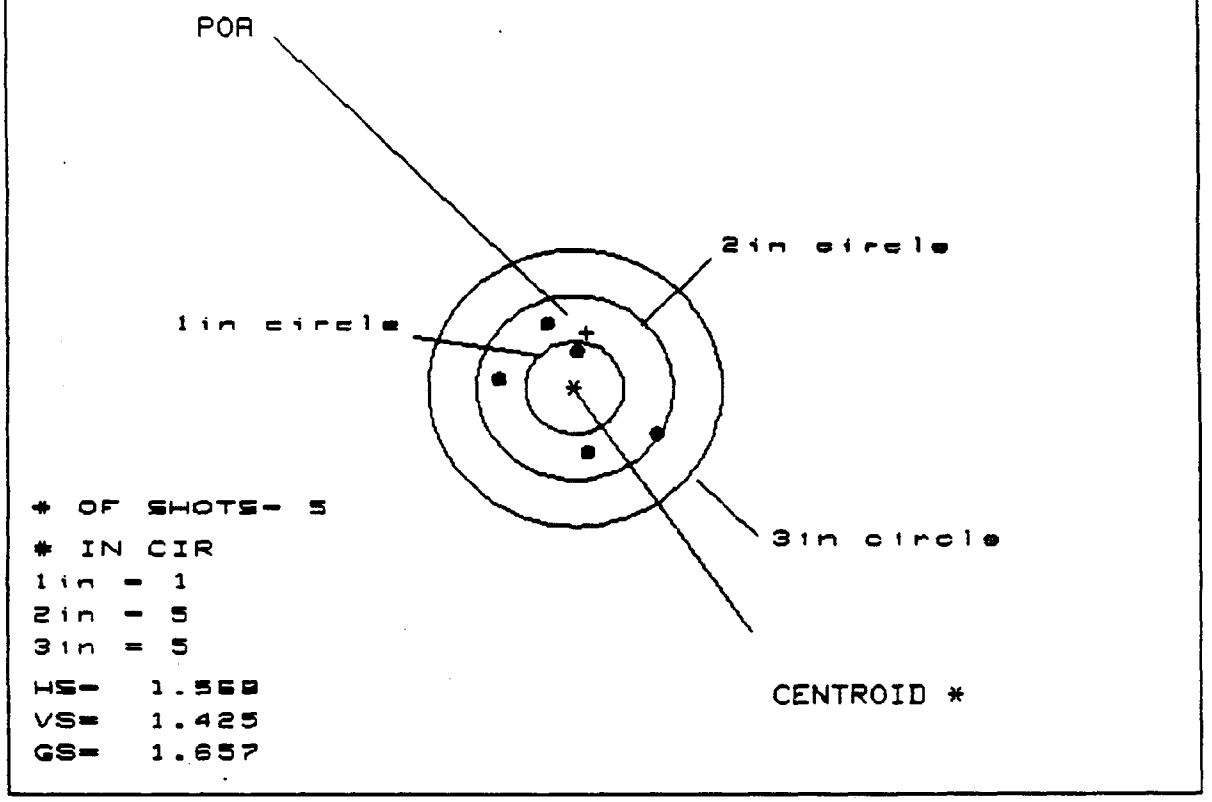
# OF SHOTS= 5
# IN CIR
1in = 0
2in = 1
3in = 2
HS= 3.535
VS= 1.661
GS= 3.560

PATTERN #	:	[redacted]		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.801	1.608	1.180
MINIMUM X	:	-1.734	-1.283	-1.323
MAXIMUM Y	:	.505	.583	.572
MINIMUM Y	:	-1.156	-1.079	-1.089
CENTROID X	:	.842	.391	.819
CENTROID Y	:	-2.836	-2.913	-2.903
POA TO CENTROID in.	:	2.958	2.940	3.016
MIN RADIUS	:	.519	.816	.589
MEAN RADIUS	:	1.428	1.269	1.285
MAX RADIUS	:	1.828	1.936	1.606
HORIZONTAL SPREAD	:	3.535	2.891	2.503
VERTICAL SPREAD	:	1.661	1.661	1.661
EXTREME SPREAD	:	3.560	3.074	2.974
NUMBER IN ONE INCH CIRCLE	=		0	
NUMBER IN TWO INCH CIRCLE	=		1	
NUMBER IN THREE INCH CIRCLE	=		2	

AFTER -40°F WOOD STOCK.

21 Oct 1986

CENTERFIRE PATTERNS # 10

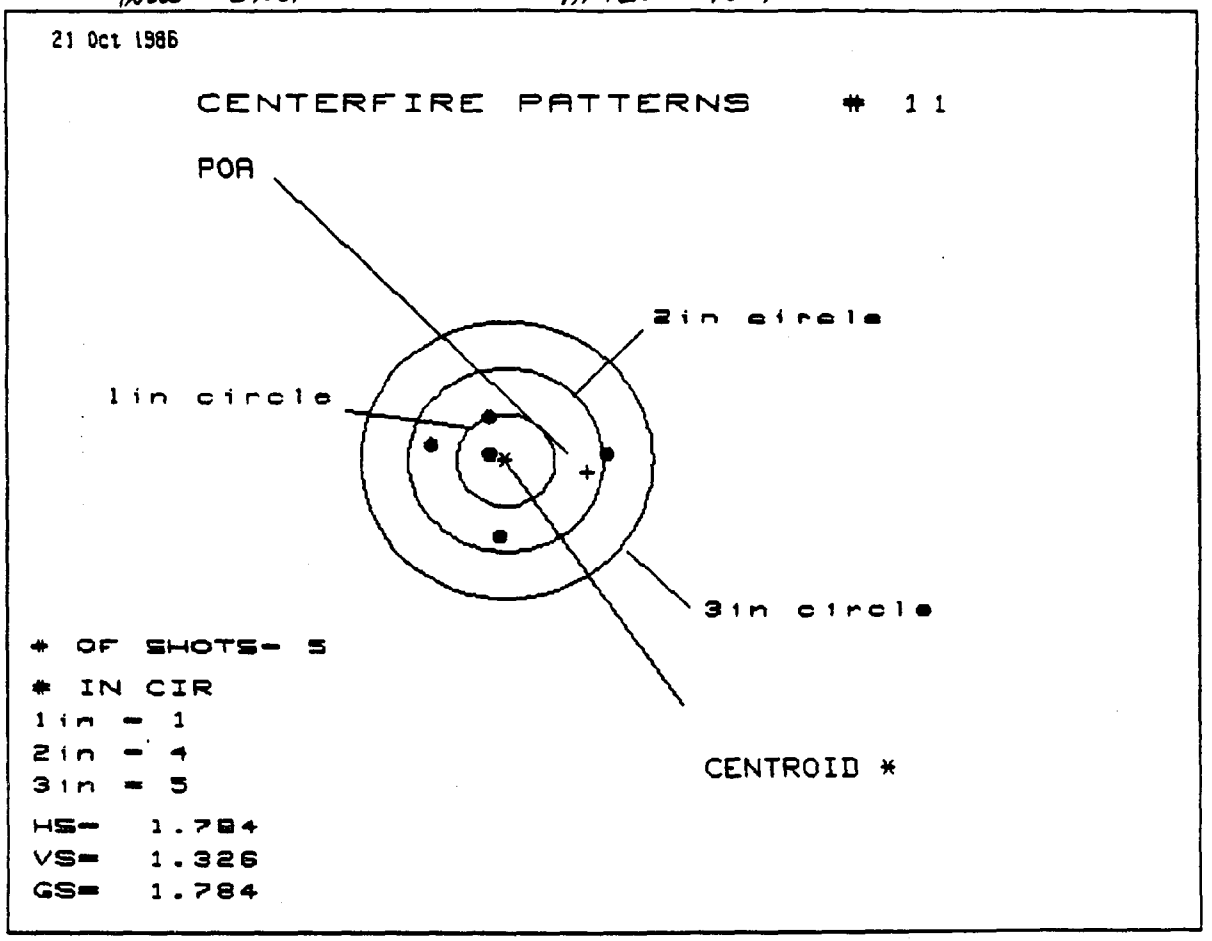


# OF SHOTS= 5
# IN CIR
1in = 1
2in = 5
3in = 5
HS= 1.568
VS= 1.425
GS= 1.657

PATTERN #	:	10		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.840	.362	.325
MINIMUM X	:	-.728	-.518	-.555
MAXIMUM Y	:	.728	.615	.451
MINIMUM Y	:	-.697	-.810	-.605
CENTROID X	:	-.126	-.336	-.299
CENTROID Y	:	-.599	-.486	-.691
POA TO CENTROID in.	:	.612	.590	.752
MIN RADIUS	:	.364	.363	.506
MEAN RADIUS	:	.712	.599	.590
MAX RADIUS	:	.955	.887	.687
HORIZONTAL SPREAD	:	1.568	.880	.880
VERTICAL SPREAD	:	1.425	1.425	1.056

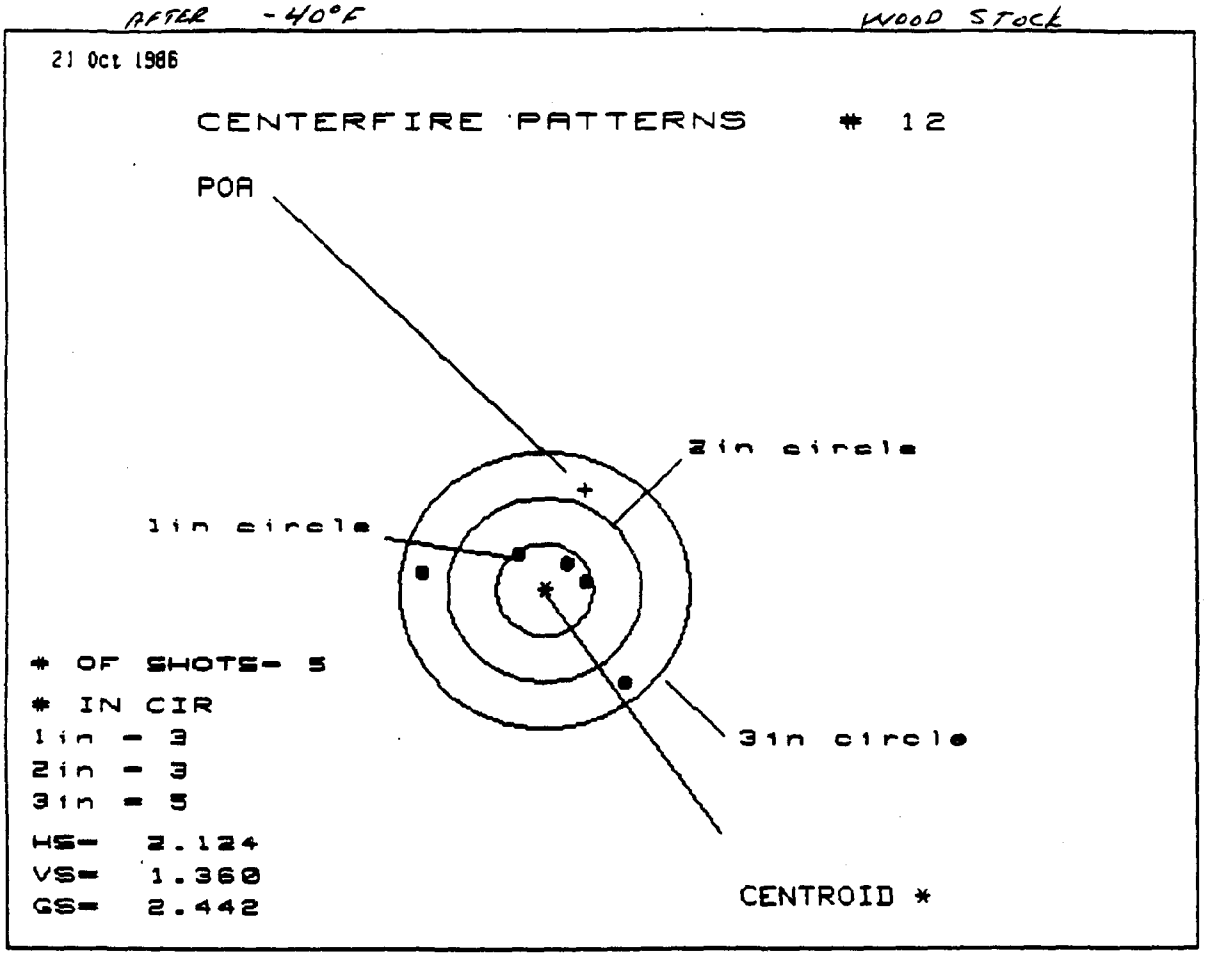
EXTREME SPREAD	:	1.657	1.501	1.163
NUMBER IN ONE INCH CIRCLE	=	1		
NUMBER IN TWO INCH CIRCLE	=	5		
NUMBER IN THREE INCH CIRCLE	=	5		

WOOD STOCK AFTER -40° F



PATTERN #	:	[redacted]		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	1.065	.230	.209
MINIMUM X	:	-.719	-.453	-.376
MAXIMUM Y	:	.494	.522	.254
MINIMUM Y	:	-.832	-.804	-.153
CENTROID X	:	-.832	-1.098	-1.175
CENTROID Y	:	.128	.100	.368
POA TO CENTROID in.	:	.842	1.103	1.231
MIN RADIUS	:	.160	.175	.259
MEAN RADIUS	:	.664	.506	.318
MAX RADIUS	:	1.071	.836	.390
HORIZONTAL SPREAD	:	1.784	.683	.585
VERTICAL SPREAD	:	1.326	1.326	.407
EXTREME SPREAD	:	1.784	1.333	.650
NUMBER IN ONE INCH CIRCLE	=		1	
NUMBER IN TWO INCH CIRCLE	=		4	
NUMBER IN THREE INCH CIRCLE	=		5	

AFTER -40°F WOOD STOCK



PATTERN #	:	[redacted]		
SHOTS (BEST OF)	:	5	4	3
MAXIMUM X	:	.840	.519	.285
MINIMUM X	:	-1.284	-.572	-.399
MAXIMUM Y	:	.384	.441	.134
MINIMUM Y	:	-.976	-.919	-.195
CENTROID X	:	-.426	-.185	-.278
CENTROID Y	:	-1.087	-1.144	-.837
POA TO CENTROID in.	:	1.167	1.149	.882
MIN RADIUS	:	.406	.158	.138
MEAN RADIUS	:	.779	.577	.299
MAX RADIUS	:	1.304	1.056	.421
HORIZONTAL SPREAD	:	2.124	1.091	.684
VERTICAL SPREAD	:	1.360	1.360	.329
EXTREME SPREAD	:	2.442	1.744	.759
NUMBER IN ONE INCH CIRCLE	=		3	
NUMBER IN TWO INCH CIRCLE	=		3	
NUMBER IN THREE INCH CIRCLE	=		5	