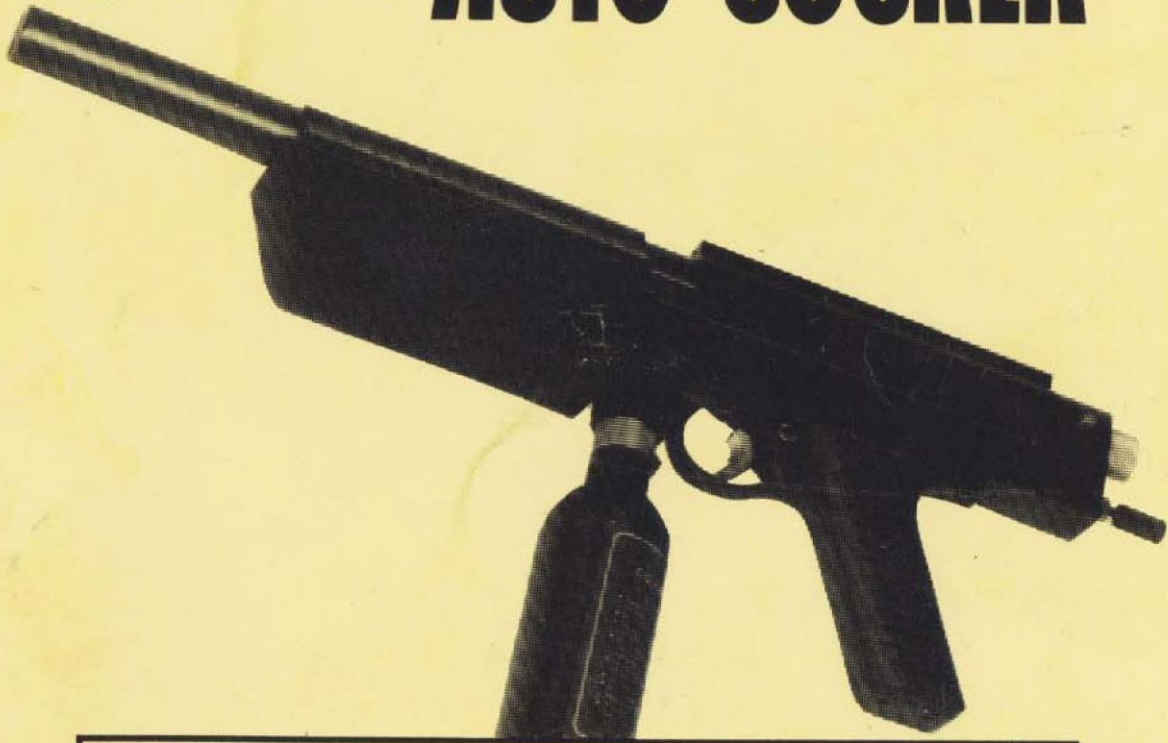


Operating Instructions
And
Safety Manual
For

Bud Orr's **AUTO-COCKER**



WARNING: This is not a toy. To be used by adults only. To be used on I.P.P.A. safety certified fields only. Obey all local, state, and federal laws. Read all instructions before use.

WORRGAME
PRODUCTS

13517 Alondra Blvd., Santa Fe Springs, CA 90670

NOTE: To ensure the greatest possible performance, reliability, and safety, thoroughly read this manual before using your Sniper II Auto-Cocker.

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Introduction

Congratulations on your purchase of a wOrr Game Products, Inc. Sniper II Auto-Cocker. This gun was manufactured from the highest quality aluminum and rust resistant stainless steel. Before leaving the factory, your Sniper II was thoroughly inspected and test fired to ensure years of reliable, trouble free service. You own the finest auto-cocker paintball gun on the market today.

Please remember this gun is not a toy, and it is capable of inflicting serious injury to people and animals if not used properly. Most gun accidents happen because the shooter carelessly violates the most important rules of safety. Prior to loading and firing the gun, always make sure that all people within the range of the gun (including yourself) are wearing approved eye and head protection. Always insert the barrel plug when not on the playing field.

This gun is not a toy and must be kept out of the reach of children.

CAUTION: DO NOT OPERATE THIS GUN WITHOUT EYE PROTECTION. DO NOT PUT ANY PART OF YOUR BODY DIRECTLY IN BACK OF THE COCKING BLOCK WHEN YOU ACTIVATE THE TRIGGER. WHEN THE COCKING BLOCK IS IN THE REARWARD POSITION, DO NOT PLACE ANYTHING BETWEEN THE COCKING BLOCK AND THE MAIN BODY. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY CAUSE DAMAGE TO THE GUN AND POSSIBLE GRIEVOUS INJURY TO THE OPERATOR.

Basic Operation

The Sniper II fires from a closed bolt. The auto-cocker system only activates during the last half of the trigger pull. The final portion activates a three-way valve that allows CO2 to enter the front side of the activating cylinder. This in turn pushes the cocking block backward approximately 1" and moves the bolt and cocking rod backwards. At this time the hammer latches and a paintball drops into the breech.

The bolt and cocking assembly remains in the rearward position until you release the trigger. Releasing the trigger reverses the three-way valve. This vents the CO2 from the front of the activating cylinder and routes CO2 to the rear of the activating cylinder. The cylinder then pulls the cocking block and bolt into the forward position. The gun is now ready to fire.

The first half of the next trigger pull releases the hammer, firing the gun, and the second half of the pull repeats the above steps.

NOTE: This gun will not shoot liquid CO2. Do not use a siphon tube bottle or mount the bottle so liquid enters the gun (e.g., California Sniper or Bottom Line). You must have these styles of mounting equipped with an anti-siphon device in the CO2 cylinder prior to use.

Adjustments

NOTE: Always make sure you, and everyone around you, wears eye protection when you adjust the gun or check for paintballs in the gun.

When you receive your Sniper II you must make an adjustment to the regulator before use (see pg. 5).

Before making any adjustments to your Sniper II check the barrel to make sure there are no paintballs inside. You can do this in one of two ways. The first method is to remove the barrel from the gun and look in it. The second method is to remove the bolt from the gun, force a cleaning rod through the cocking block towards the front of the gun, then remove the cleaning rod and insert the bolt.

Once you are certain that there are no paintballs in the gun and feeder system, and you have your eye protection on, you are ready to make your adjustments. Refer to the illustration on pages 10-11 and the appropriate section of this manual while adjusting your Sniper.

Regulator Adjustment

After checking that there are no paintballs in the gun, your first step is to locate the pressure regulator. It is housed inside the fore-grip of the gun. Slide the fore-grip straight forward to remove. Always hold the gun pointing away from you, and others, with the barrel plug installed or the barrel removed.

1. Do not remove, only loosen, the knob at the forward end of the regulator (about one turn counterclockwise). If you remove the knob while the gun is under pressure, the spring and piston may fly out of the regulator. Always point the regulator toward the ground for safety.
2. Install CO2 source.
3. Pull the trigger all the way back, as if you were firing the gun, and hold it back.
4. Slowly turn the regulator adjusting knob clockwise. This causes the cocking block, at the back of the gun, to move backwards. Continue turning the adjusting knob slowly until the cocking block touches the cocking knob. Now cycle the trigger (pull and release), and continue to very slowly turn the regulator knob clockwise until the gun fires. It is important to cycle the gun after each adjustment of the knob. Do not turn the regulator knob any farther than it takes to cock the gun. Over pressurizing the regulator damages the system.
5. The system requires very little adjustment after the initial setting unless there is a large temperature change.

Three-Way Valve Coupling Adjustment

NOTE: The three-way valve actuating rod should never need adjustment unless the rod is removed. Never remove the rod unless there is a problem with the air receiver or the three-way valve.

If the trigger assembly needs removal, remove the two retaining screws and slide the trigger frame to the left side. This will prevent having to remove the actuating rod from the three-way valve.

In the event the rod requires adjusting, follow these steps:

1. Make sure the barrel plug is installed and the gun does not have a paintball in the barrel or a feeder on the gun.
2. Install CO2 source.
3. There are two set screws on the coupling. Loosen the set screw closest to the trigger.
4. Slide the coupling forward until it stops. (DO NOT FORCE IT.)
5. Take the actuating rod and slide it back until it touches the back of the slot in the trigger. (Don't move the trigger backwards. Just touch the back of the slot with the rod.) Now tighten the set screw.
6. Test fire the gun, slowly moving the trigger backwards until the gun fires. The gun should fire prior to the bolt moving backwards. If it fires properly, no more adjustment is required. If the bolt retracts before firing, repeat steps 3-5.

Cocking Block to Cocking Cylinder Adjustment

1. Make sure the barrel plug is installed and the gun does not have a paintball in the barrel or a feeder on the gun.
2. Remove the bolt and the cocking rod from the gun. Loosen the cocking block by turning the block counterclockwise on its rod.
3. Install CO2 source.
4. When you pressurize the system the cylinder should retract completely (pulling the block forward). At this time there should be a gap between the cocking block and the main body.
5. Rotate the cocking block clockwise until it touches the main body of the gun. Continue rotating the cocking block until the large hole in the cocking block lines up with the large hole in the main body.
6. Install the bolt and cocking rod, and your adjustment is complete.

Bolt/Cocking Rod Adjustment

Two things affect the bolt backward travel:

- The cocking block to actuating cylinder adjustment.
- The cocking rod adjustment.

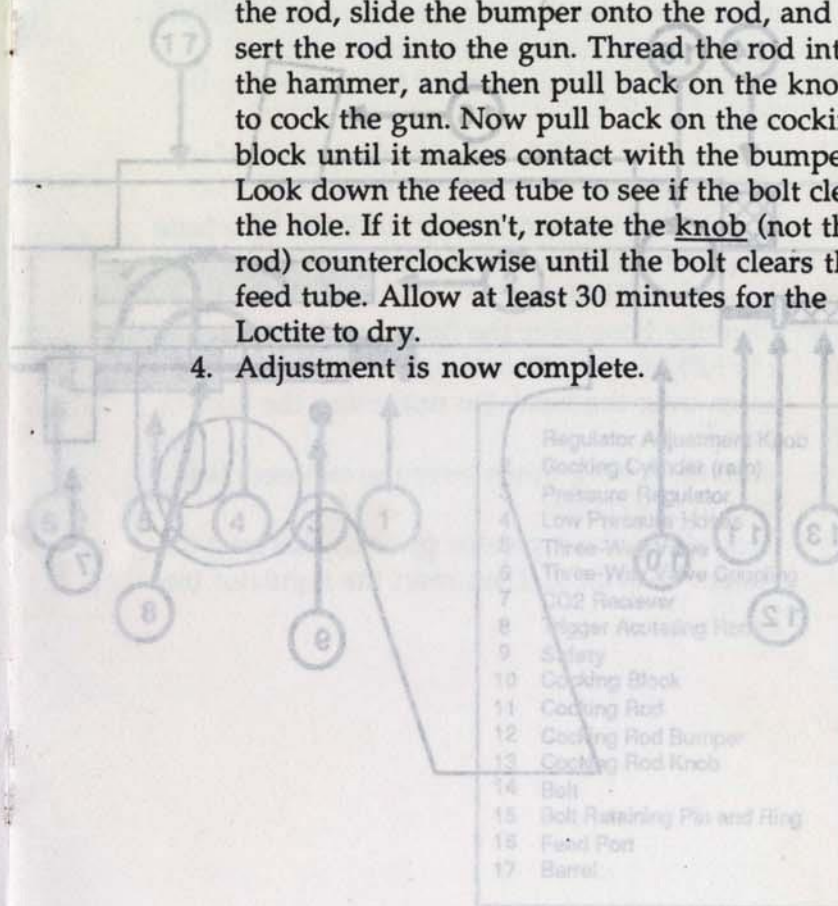
To check the cylinder adjustment, remove the cocking rod, pull the cocking block backward until it stops, and look down the feed tube to see if the bolt tip has cleared the feed tube hole. If it does not clear the hole, refer to the Cocking Block to Cocking Cylinder Adjustment section (pg. 7) of this manual. If the bolt does clear the hole, the cocking rod requires no further adjustment. To adjust the cocking rod, perform the following steps:

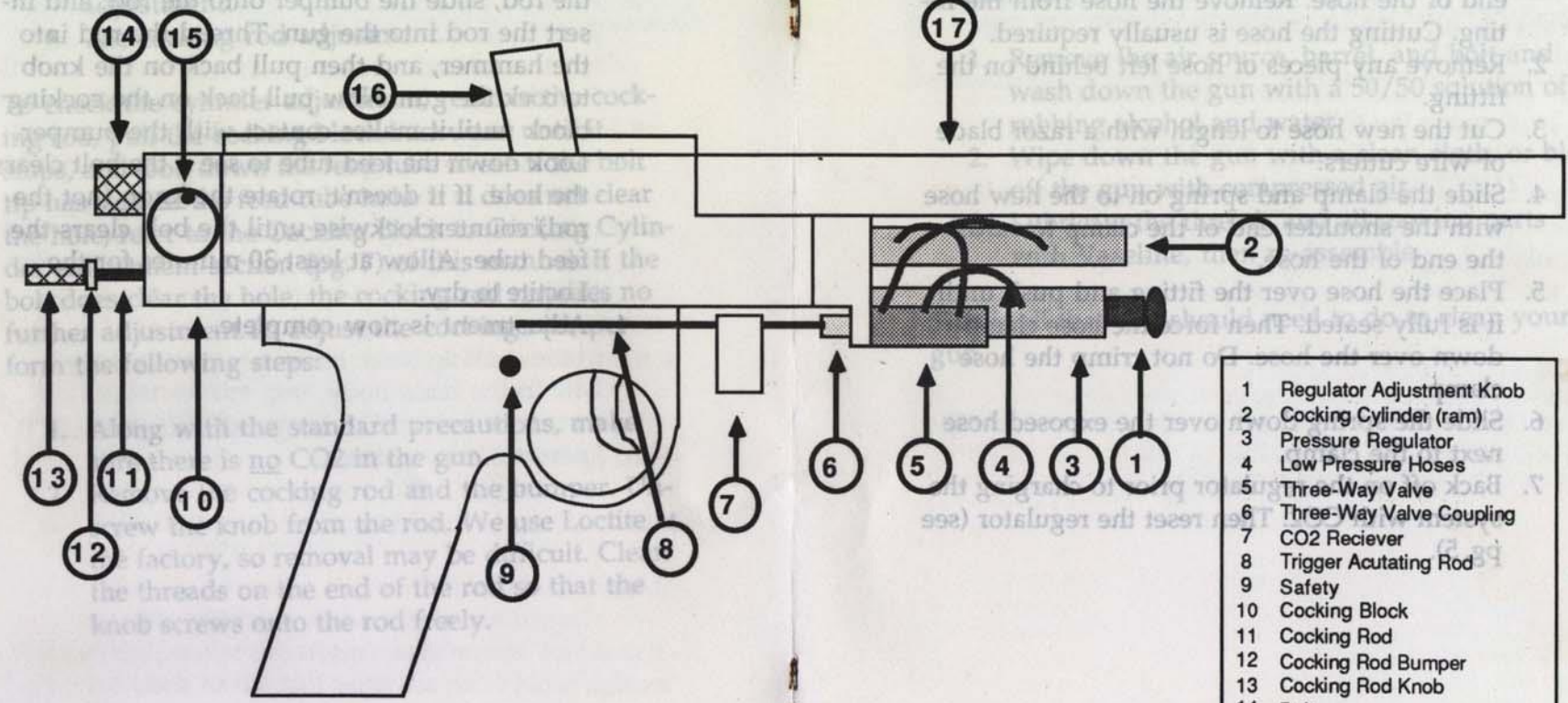
1. Along with the standard precautions, make sure there is no CO2 in the gun.
2. Remove the cocking rod and the bumper. Unscrew the knob from the rod. We use Loctite at the factory, so removal may be difficult. Clean the threads on the end of the rod so that the knob screws onto the rod freely.

Continued on next page...

Bolt/Cocking Rod Adjustment...cont.

3. Begin by putting a drop of Loctite in the knob threads (Do not put Loctite on the threads that go into the gun.). Then screw the knob onto the rod, slide the bumper onto the rod, and insert the rod into the gun. Thread the rod into the hammer, and then pull back on the knob to cock the gun. Now pull back on the cocking block until it makes contact with the bumper. Look down the feed tube to see if the bolt clears the hole. If it doesn't, rotate the knob (not the rod) counterclockwise until the bolt clears the feed tube. Allow at least 30 minutes for the Loctite to dry.
4. Adjustment is now complete.





- | | |
|----|-----------------------------|
| 1 | Regulator Adjustment Knob |
| 2 | Cocking Cylinder (ram) |
| 3 | Pressure Regulator |
| 4 | Low Pressure Hoses |
| 5 | Three-Way Valve |
| 6 | Three-Way Valve Coupling |
| 7 | CO2 Reciever |
| 8 | Trigger Acutating Rod |
| 9 | Safety |
| 10 | Cocking Block |
| 11 | Cocking Rod |
| 12 | Cocking Rod Bumper |
| 13 | Cocking Rod Knob |
| 14 | Bolt |
| 15 | Bolt Retaining Pin and Ring |
| 16 | Feed Port |
| 17 | Barrel |

Continued on next page...

Hose Replacement

To replace the hose, follow these steps:

1. Slide the brass clamp and spring away from the end of the hose. Remove the hose from the fitting. Cutting the hose is usually required.
2. Remove any pieces of hose left behind on the fitting.
3. Cut the new hose to length with a razor blade or wire cutters.
4. Slide the clamp and spring on to the new hose with the shoulder end of the clamp towards the end of the hose.
5. Place the hose over the fitting and push until it is fully seated. Then force the hose clamp down over the hose. Do not crimp the hose clamp.
6. Slide the spring down over the exposed hose next to the clamp.
7. Back off on the regulator prior to charging the system with CO₂. Then reset the regulator (see pg. 5).

17	Barrel
18	Feed Port
15	Bolt Retaining Pin and Ring
14	Bolt
13	Cocking Rod Knob
12	Cocking Rod Bumper
11	Cocking Rod
10	Cocking Block
9	Safety
8	Trigger Actuating
7	CO ₂ Receiver

Cleaning the Gun

NOTE: Always wear eye protection.

It isn't necessary to completely disassemble your gun to clean it.

1. Remove the air source, barrel, and bolt and wash down the gun with a 50/50 solution of rubbing alcohol and water.
2. Wipe down the gun with a clean cloth, or blow off the gun with compressed air.
3. Lubricate the threads and all moving parts with Vaseline, then re-assemble.

This is all that you should need to do to clean your gun.

NOTE: THE VELOCITY IS NOT CONTROLLED BY THE PRESSURE REGULATOR IN THE FORE GRIP.

Lubricating the Auto-Cocker System

NOTE: Do not use synthetic based oil or any lubrication other than 10 weight or lighter oil. (3 in 1 or sewing machine oil is recommended.) USE OF ANY OTHER LUBRICANT VOIDS YOUR WARRANTY AND YOU BECOME RESPONSIBLE FOR ALL REPAIR COSTS.

1. Remove the CO2 source.
2. Place three (3) drops (NO MORE THAN THREE DROPS!) in the air receiver every three or four bottles of CO2.

Velocity Adjustment

To adjust the Sniper's velocity:

1. Remove the cocking rod (located at the rear of the gun).
2. Insert a 3/16" allen wrench until it engages the adjusting screw.
3. Turn the wrench clockwise to increase the velocity, or counterclockwise to decrease the velocity.
4. Turning the wrench one flat at a time changes the velocity approximately 20 fps. Always use a chronograph to verify that your gun's velocity has not exceeded the maximum safety limit of 300 fps.

NOTE: THE VELOCITY IS NOT CONTROLLED BY THE PRESSURE REGULATOR IN THE FORE GRIP.

Troubleshooting

NOTE: Do not attempt to perform any factory only repairs; you must send the gun to the factory or an authorized repair center. Call wOrr Game Products for further information.

Problem	Cause	Corrective Action
Low velocity.	A. Improper Adjustment.	A. Adjust velocity.
Gun won't fire after left in sun or hot place with bottle attached.	A. Bottle pressure exceeds 1100 psi and won't allow exhaust valve to open.	A. Remove bottle from gun to allow excess CO2 to escape.
Velocity varies widely from shot to shot.	A. Cocking rod is bent or dragging. B. Exhaust valve cupped or spring weak. C. Shooting liquid.	A. Replace cocking rod. B. Replace exhaust valve or spring. C. Alter mounting of bottle. Do not use siphon tube.
When gun is cocked it takes very little trigger-pull to fire the gun.	A. Sear spring is too light.	A. Remove one of the grips and adjust by stretching the spring.
Chops Paintballs	A. Cocking block or rod out of adjustment.	A. Adjust rod or cocking block.
Gun won't cock.	A. Pressure too low. B. Hammer cocking lug out of adjustment.	A. Fill bottle or adjust regulator. B. Set the cocking lug to .048 to .053 below the gun body.

Troubleshooting...cont.

Problem	Cause	Corrective Action
Gun won't fire when trigger is pulled.	A. Low on CO2. B. CO2 pressure too high. C. Hammer cocking lug loose. D. Three way valve improperly adjusted. E. Damaged ram.	A. Fill Bottle. B. Remove and then reinstall bottle. C. Tighten or adjust lug. D. Adjust three-way valve. E. Factory only! not attempt to repair!
Hose blows off.	A. Regulator pressure too high.	A. Adjust regulator pressure.
Air receiver on the gun is loose or leaking.	A. Retaining screw loose or damaged.	A. Factory only! Do not attempt to repair!
Barrel hard to install or remove.	A. Semi-block mis-aligned. B. Threads damaged.	A. Align semi-block at front of gun. B. Factory only.
Trigger screws stripped.	A. Over tightening.	A. Factory only.
Gun shoots too low in winter.	A. When ambient temperature drops below 30 degrees F, bottle pressure also drops to below 500 psi and velocity drops accordingly.	A. Live with it. DO NOT HEAT THE BOTTLE. This may cause serious injury to yourself or others.
Leaking CO2 between valve and air receiver.	A. Bad valve o-ring.	A. Replace valve o-ring. This is the external o-ring at the top of the valve.

Troubleshooting...cont.

Problem	Cause	Corrective Action
Gun won't fire properly after removing and replacing bolt.	A Bolt installed upside down	A Remove bolt. Reinstall after rotating 180 degrees.
Three-way valve leaks out of the front or back.	A Three-way valve not adjusted properly. B If leaking from the back (trigger) side of the valve, the ram is blown out. C If leaking from the front side, the o-ring in the valve may be bad.	A Adjust three-way valve. B. Factory only. C. Factory only.
Leaks CO2 between bottle and valve.	A Loose valve.	A DO NOT CONTINUE LOOSENING THE BOTTLE! Fire the gun and push on the cocking rod to dump all the CO2 out of the bottle before removing it from the gun. Send bottle and valve to factory for repair. DO NOT ATTEMPT TO REMOVE THE VALVE. DO NOT REPAIR OR USE THE BOTTLE.

Designer's Notes

Many players talk about how efficient their guns are, and often brag about how many shots they get from a 7-oz. bottle. In designing the auto-cocker operating system of the Sniper II we needed to know the theoretical mass of CO2 required to cycle the gun.

Our first step was to determine what equation was appropriate for our needs. Through some calculations we determined that the *Ideal Gas Law* ($PV = nRT$) would give us the mathematical accuracy that we needed.

Our constants and variables were as follows:

- P = Working pressure in atmospheres.
- V = Cylinder volume in liters.
- n = The number of Moles of CO2.
- R = The Gas Constant in liter atmospheres/Mole/degree Kelvin.
- T = Operating temperature in degrees Kelvin.

We calculated many combinations of working pressures and cylinder sizes to determine the best performance possible. The final product uses a 3/16" bore, a 1" stroke, and a working pressure of 150 psi. We calculated usage based on an ambient operating temperature of 25 degrees C.

For the system the volume (V) = $\text{Pi} \times \text{radius}^2 \times \text{stroke}$.
Or $V = 3.14 \times (3/16)^2 \times 1 = .1104$ cubic inches = .0018 liters.

The pressure (P) = $150 \text{ psi}/14.7 = 10.20 \text{ ATM}$.

Designer's Notes...cont.

The temperature (T) = degrees C + 273 = degrees Kelvin
= 25 + 273 = 298.

Using the *Ideal Gas Law* we get:

$$10.20 \times .0018 = n \times .08206 \times 298$$

Some simple math gives us:

$$n = .00075 \text{ moles of CO}_2 = .033 \text{ grams}$$

This is for one firing cycle, or two strokes, of the gun.
To fire the Sniper II 300 times would take less than
1/3 of an ounce of CO₂. The efficiency of the auto-
system using a 7-ounce bottle is an outstanding
95.5%.