EXAMINATION OF 12 GAUGE FLARE GUNS

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Introduction

• A prosecutor’s call outlined an event where a suspect fled from police...
• At one point during the chase, a shot was fired in the direction of the pursuing officer...
• The shot missed the officer, but the suspect got away.
Introduction

• No gun was ever recovered
• ~30 days later, the suspect was re-arrested after a short chase
• At this arrest, suspect possessed a .45 Automatic and .22 caliber firearm
Suspect Statements

• The suspect said that he had a Flare Gun that he had stolen from a boat on the docks--he hoped to recover Phosphorous to cook Methamphetamine

• “...I didn’t want to get caught with the flare gun so I took off running...”
Suspect Statements

• “…pulled the gun from my coat…turned toward the Officer to throw the flare gun…”

• “…as I was throwing it, the flare gun discharged…”

• Shooting distance approximately 10 feet
Questions to Address

• What was fired in the direction of the officer?
• If a flare gun, then what was the potential for injury to the officer?
• Where was the expended flare?
• Where was the flare gun?
Flare Gun Background

• Signal flares first patented as “Pyrotechnic Night Signals” in 1859 by Martha Coston
• Flare guns exist in 12 gauge, 25 mm, 37 mm and many other larger calibers
• I evaluated 12 gauge which represents the lower end of flare gun energies
A 1990 memo provided by SFC stated:

“...Information received from Bellmore-Johnson today on the test firing of the 12 gauge launcher are as follows”:

velocity w/o mass-------------------193 fps
velocity w 11 gms. mass (standard meteor weight)-------14 ft lbs
Characteristics of the Orion 12 Gauge Flare Gun
Orion 12 Gauge Flare Gun

- Similar in size to a small revolver
- Orange plastic with black plastic grips
- Smooth bore ~0.73” diameter
Single shot, break open
Only
Plastic hammer block inside the frame
15 Total Components
Trigger pull ~ 4 pounds

3 inch barrel, 7 inch overall
Barrel Length ~3"

After market breech safety clip
Steel Reinforcement on Breech Face
12 Gauge Signal
Flare Ammunition
Skyblazer manufactures 12 gauge flares that can be fired from an Orion flare gun. The Orion flare gun comes with Orion 12 gauge signal flares.
• ~250’ launch altitude
• 6 second burn time
• 15,000 candle power
• Visibility 21 miles
Typical 12 Gauge 2 ½” Shot shell

~ ½ inch shorter
Orion Red Meteor

Low cup shotshell

“Flare” Projectile
175-200 grains

Plastic end wad

Note the absence of gun powder propellant.
Orion Red Meteor

- Magnesium
- PVC
- Strontium Nitrate
- Strontium Peroxide
- Black Powder**

**Black powder assists ignition of the other products... it is not present to increase velocity.
Orion Projectile

Skyblazer Projectile

175-200 grains

109 grains
• Over 425 foot launch altitude

• Up to 8 second burn time
• use in all universal 12 gauge flare launchers (i.e. Orion)

• Breech safety clip IS REQUIRED
Typical 12 Gauge 2” Shot shell

~ ¼ inch shorter
Skyblazer

BASE W/PRIMER

PROJECTILE (Flare)

109 grains
Skyblazer

-Potassium Perchlorate
-Magnesium*
-VYHH
-Dextrin
-Strontium Nitrate*

*(Seen in Orion)
After Market BREECH CLIP (by Skyblazer)
VELOCITY/ENERGY DETERMINATION
Using a Prochrony, the velocity of the flares were measured

“Spent” projectiles were located

A flare was fired into the water tank

Trajectory evaluation was done using the Oehler ballistic explorer
Velocity Data

Orion muzzle velocity
-~334 fps (n=15)
-range 62-615 fps

Skyblazer muzzle velocity
-~238 fps (n=13)
-range 213-271 fps
Orion Muzzle Velocity

Mean = 102 fps (n=6)

Mean = 488 fps (n=9)
Muzzle Energy Calculation

Orion---~110 ft lbs energy
Skyblazer---~ 35 ft lbs energy

(Formula $E = \frac{MV^2}{2}$)
Observations

The heat from the burning flare consumes nearly all of the aluminum case leaving little or nothing to find after the burn.
Observations

Collectively, the components from the flare are burning in the range of 1800-2000 degrees F
Observations

• These flares are exclusively primer fired
• A true velocity/energy calculation is very difficult due to the changing mass of the projectile over time.
• There is a short built in delay between flare ignition and projectile departure
Conclusions

• Average velocity and energy is low from 12 gauge flare guns and it is unlikely that simply being hit by a flare would be lethal

• The primary danger appears to be associated with the temperature and potential ignition of tissue or clothing rather than velocity/energy.
Conclusions

RCW 9.41.010

(1) "Firearm" means a weapon or device from which a projectile or projectiles may be fired by an explosive such as gunpowder.

--Therefore, a flare gun is a firearm.
Conclusions

Since the Orion is single action and has an internal safety, it is unlikely that a similar flare gun would discharge in the act of throwing it.

--Therefore, the suspect likely pulled the trigger.
Epilog

• Although an extensive search for the flare gun was conducted, none was ever found (no cartridge case ever found either)

• Information provided after the trial revealed that the officer being fired upon saw a muzzle flash and heard a loud report and believed that the shot was from a real revolver not a flare gun
Epilog

The suspect was found guilty on all counts:

Felon in possession of a firearm.....(14 months)
Possession of Methamphetamine.....(6 months)
2nd degree assault (w/firearm).......(54 months)

4.5 years (concurrent)