Reloading 37mm Rounds

The 37mm Flare/Gas launcher is popular with hunters, boaters, pyrotechnic enthusiasts and those into preparedness. It is not considered a firearm, and is not subject to the Gun Control Act of 1968.

The 37mm flare launcher is similar in appearance to the M79 grenade launcher that the US military first debuted during the Vietnam war early in the sixties. The M79 (and hence, the 37mm launcher) slightly resembles a large bore, single barrel, sawed-off shotgun in appearance.

The military created the M79 to be used as a close support weapon for the infantry. The intended range of fire was between 50 and 300 meters. The device was in reality a single shot, shoulder fired, break-barrel loading weapon which accepted and fired 40mm grenades. The M79 accepted many different types of rounds, including explosive, flechette (rounds which housed approx 45 small darts in a plastic casing), smoke, CS gas, and flare rounds.

Unlike the 40mm M79, the 37mm flare launcher is only legal as a signalling device. As long as no anti-personnel rounds are manufactured, possessed or used, the device is totally legal (see additional information below).

Many enthusiasts have expressed an interest in reloading the cases of the 37mm launcher, as the rounds can typically cost from $5 to $25 dollars each.

Cautions and Warnings
Realize that if you are working with black powder and chemicals, you must take every precaution to ensure that your rounds work as expected, that is, safely! Realize that improper loading of 37mm rounds can result in the loss of life or limb!! Do not guess, do not estimate, and do not substitute. Make sure that the epoxy effectively seals off the payload area from the area with the lift charge! Failure to do so could cause your round to ignite within the chamber of the launcher and cause the launcher to explode! Do not smoke while you are working on the rounds! Keep them away from any heat or fire! Keep all of the above chemicals away from heat and fire. Do not attempt ANY of the above if you are not an adult. Do not let children anywhere near your rounds or chemicals. Do not aim towards ANY living thing. Do not place metal objects in your rounds. Do not create explosive devices for your 37mm launcher; to do so would be a felony. If a 37mm round is designed to create harm to a human being, it makes your launcher a descructive device, and subject to federal rules and regulations on NFA weapons. You can go to prison if you create such a device without paying the appropriate taxes for such a device. Do not fire the rounds in areas with houses, buildings, dry grasses, or living creatures. The safest place to fire your rounds would ideally be out over a large body of water! If you attempt to make any of the rounds described in this text, you agree that the author, publisher and this web site are not liable in any way in cases of accidents. Reading this document any further means that you acknowledge this.

Legalities of 37mm Rounds*

*always check your local laws and statutes before using or reloading 37mm rounds
From James O. Bardwell's (bardwell@netcom.com) FAQ On National Firearms Act Weapons

"Smooth bore 37mm projectile launcher - not a DD. Not even a title 1 firearm. This item falls under the "not a weapon" (signaling device) exception, I believe. Generally a large bore device

for which no anti-personnel ammo has ever been made will NOT be a DD. This used to be true of the 37mm guns. However, according to ATF, some folks have started making anti-personnel rounds for these guns, and ATF has ruled that possession of a 37mm launcher and a bean bag or rubber shot or similar round is possession of a DD, and at that point the launcher needs to be registered. Put another way, before you make or buy anti-personnel rounds for your 37mm launcher, register it as a DD. The rounds themselves, not being explosive, incendiary or poison gas, are not regulated in themselves either. It is just the two together. See ATF Ruling 95-3."

Section 5845(f), Title 26, U.S.C., classifies certain weapons as "destructive devices" which are subject to the registration and tax provisions of the NFA. Section 5845(f)(2) provides as follows:

(f) Destructive device.--The term "destructive device" means * * *

(2) any type of weapon by whatever name known which will, or which may be readily converted to, expel a projectile by the action of an explosive or other propellant, the barrel or barrels of which have a bore of more than one-half inch in diameter, except a shotgun or shotgun shell which the Secretary or his delegate finds is generally recognized as particularly suitable for sporting purposes; ..."

A "sporting purposes" test which is almost identical to that in section 5845(f)(2) appears in 18 U.S.C. § 925(d)(3). This provision of the Gun Control Act of 1968 (GCA) provides that the Secretary shall authorize a firearm to be imported into the United States if the firearm is "generally recognized as particularly suitable for or readily adaptable to sporting purposes." With the exception of the readily adaptable' language, this provision is identical to the sporting shotgun exception to the destructive devices definition. The definition of "destructive device" in the GCA (18 U.S.C. § 921(a)(4)) is identical to that in the NFA.

Classification of Gas/Flare Guns with Anti-Personnel Ammunition as Destructive Devices

Recently ATF issued ATF Ruling 95-3, holding that 37/38 mm gas/flare guns possessed with "anti-personnel" ammunition, consisting of cartridges containing wood pellets, rubber pellets or balls, or bean bags are destructive devices as degined in the Gun Control Act and the National Firearms Act and require registration to be lawfully possessed.
Devices designed for expelling tear gas or pyrotechnic signals have been held to be exempt from the destructive device definition. However, when a gas/flare gun is possessed with "anti-personnel" ammunition, it is then capable of use as a weapon. Thus, it becomes a firearm and is no longer exempt from the destructive device definition.

Any person who will possess a gas/flare gun in combination with "anti-personnel" ammunition must register the making of a destructive device prior to the acquistion of both the gun and the "anti-personnel" ammunition. The gas/flare gun must be indentified must be identified with the required markings, including serial number. Any person engaged in the business of buying or selling the combination of the gas/flare gun and "anti-personnel" ammunition must have the appropriate Federal firearms license and/or have paid the appropriate special (occupational) tax.

If you have any questions regarding this matter, the entire text of the ruling is available in the ATF Quarterly Bulletin, Volume 3, 1995, or you may contact the National Firearms Act Branch at (202) 927-8330.

Reloading/Making 37mm Flare, Smoke and Aerial Star Burst Rounds

Cases are plastic and reloadable by use of a #209 shotgun primer. Use FFG grade black powder, 1 teaspoon per case as a lifter. I've found three types of cases:
short, extremely thick, orange cases, about 2 & 1/2 inches tall
long, thinner cases with a recess for the lift charge, about 4 inches tall
thick orange cases which accept the rifled shells - these have a cup on the bottom which holds the lift charge, about 3 inches tall

Smoke Burst Rounds
For this round, you must create a time fuse which allows the lift charge to project the round out for several seconds before it bursts. This time fuse is created by applying masking tape to a normal green (or red) visco safety fuse in such a manner (see figure 1).

Figure 1
The masking tape is placed around the fuse to protect the fuse from the epoxy as it dries. The epoxy must not soak into the fuse, as if is does, the load will not ignite and the round will just fall to the ground.

The first thing you will have to do is to create the primer composition. This is used for all 37mm rounds, and will be used in all the reloading techniques in this article (see the primer comp section below). You must purchase or create a paper "plug" which separates the lift section of the round from the load section. Several companies listed in our supplier section sell kits which contain the load shell and the paper caps which are used as the plugs.

At this point you'll want to punch a 3/32 inch hole through one of your plugs. Insert a 1 and 1/2 inch length of visco fuse to which you have wrapped masking tape around as stated above. The masking tape should run about two thirds of an inch, making sure that when you apply the epoxy in the next step that none of it touches the fuse. The fuse should stick out about one quarter inch from the bottom of the plug. The end of the fuse should be sealed with the prime compostion, and you should make sure to actually seal the fuse to the plug using the prime comp. Wait until the comp is completely dry before proceeding to the next step.

Next you must apply a ring of Elmers glue inside the case about one-quarter inch inside the case, and place the fused plug inside.

You will now need some two-part epoxy (not hot glue or white glue, but epoxy), the type that frequently comes in two tubes. Go ahead and mix them, and pour enough into the case around the fuse to come to the top of the masking tape (about one-quarter to five-sixteenth of an inch). Make sure that the epoxy does not touch the fuse (it can touch the tape, just not the fuse that has not been protected with the tape).

Once the epoxy has hardened completely, fill the rest of the chamber with your smoke mixture (*see the section on smoke mixtures for more info). Now apply a ring of glue around the inside of the top of the chamber and place the end (paper) plug in place.

The only step left is to add your lift charge to the breech cavity around the fuse (at the bottom of the round) and glue a piece of paper over the end of the round. The round can now be place in a primed case (a case with a new shotgun primer), and is ready for use!

Aerial Star Bursts

You can make aerial star bursts in much the same manner that you made the smoke bursts. You just follow the instructions as per the smoke burst, but add your stars (flare pellots) and a small amount of ffg black powder to propell the stars. Here's the breakdown of the aerial flares:
Red Star % by weight

Strontium carbonate 15.0
Potassium perchlorate 69.0
Charcoal, Air float 4.0
Red Gum or shellac 9.0
Dechlorane 3.0

Green Star

Barium nitrate 48.0
Potassium perchlorate 33.0
Copper carbonate 2.0
Red Gum or shellac 9.0
Dechlorane 8.0

White Star

Sodium nitrate 45.0
*Magnesium-100m or finer 45.0
Nitrocellulose lacquer 10.0

*Adding 10-15% magnesium to the red or green mix will increase the candle power. Add Mg-to-NC lacquer before adding to mix.
You must moisten one of the above flare (Star) mixtures using denatured alcohol (not isopropyl) or NC lacquer solution. Once it is ready, you'll press it into a "shape" approximately 1/2" to 9/16" thick. Then you'll make a slush out of prime comp and NC laquer, and spread it on the top of the star comp "shape." Cut it into small (1/2" to 9/16") squares (use a very sharp knife or razor blade) and allow it to dry at least 12 hours at room temperature. Once the shape is completely dry, break it into individual pieces. Place the pieces into the top of your casing around the fuse, pour 3/4 to 1 full tablespoon ffg black powder and glue the top plug in place with adhesive.

Aerial Signal Flare

You will create the flare compound using one of the star mixtures listed above. Using a glue such as Elmers©, make a ring around the end of your (paper) casings about 1/4" to 3/8" from the end of the casing. Push a paper plug down into the casing until it is flush with the end of the casing, and allow the glue to dry. Moisten your flare compound using denatured alcohol until it is the consistancy of cookie dough, and press the mixture into the casing using a wooden or aluminum dowel until it is approximately 70% full.
While the mixture is still moist, (using a nail), create a cavity in the mixture about 1/2" deep. Allow it to completely dry (usually 8 to 10 hours). Fill the cavity with prime comp (see below)

which has been moistened into a cake-like batter, and allow it to completely dry. Once dry, add a layer of epoxy to the casing. DO NOT cover the prime comp with the epoxy or the round will fail. Once again, allow the whole lot to dry.

Once dry, add a level teaspoon of ffg black powder to the remaining space in the casing (it will cover the prime comp and the epoxy). Glue a disk of typing paper over the end of the casing and apply a layer of Elmers glue to the outside of the paper.

Place the completed casing into your primed 37mm shell breech end first. If it is too loose in the shell, you can wrap a layer of masking tape around the casing.

Prime Composition
This is the substance that you use on the bottom end of the fuse which extends into the lift chamber...the lift powder catches the primer comp on fire, which lites the fuse, which lights the flare/smoke/bang charge.
% by weight
Potassium nitrate 45.0
Potassium perchlorate 25.0
Red Iron Oxide 5.0
Silicon 15.0
Red Rum or Shellac 8.0
Charcoal, Air float 2.0
Nitrocellulose Lacquer to batter-like slurry
*Magnesium - 100m or finer 10-15% additional

The prime comp is made by mixing the above ingrediants in exactly the percentages listed. The easiest method of calculating them is to create exactly 100 grams of prime comp, which allows you to us the above percentages as gram measurements, i.e. you would use 45 grams of Potassium nitrate, 25 grams of Potassium percholorate, etc. If you find that the prime comp is not igniting correctly when the lift charge ignites, you may want to add very fine black powder to the mixture. You would add it in ratios of 70% prime comp to 30% black powder. Again, you would use denatured alcohol (or NC lacquer) to moisten the mixture.

Smoke Mixtures

While there are several smoke mixtures available on the market, none compare to the "Ninja Smoke" mixture that Firefox sells. It is cheap, easy to mix, and unlike others on the market, it instantly bursts into a cloud of black, yellow or white smoke. This creates a perfect effect for those into roleplaying or paintballing! If you use other smoke mixtures, you will be limited to slower burning, though longer lasting smoke rounds. You would make them in much the same manner as the flare rounds (see above).

Treating the Cases with Heat Retardent
If you buy your paper casings and plugs from the firework supply companies, you'll want to treat them with a heat retardent material before you use them in your 37mm rounds. You can create your own heat retardent material from most of fireworks companies as well. You will need:

Heat Retardent
1 lb Ammonium chloride
2 oz Boric acid

1 oz Borax
1 Gallon hot water

Mix the above mixture and store in a sealed jar or container.