NEW TRIBES

BPR-8 Binary Propellant Rifle
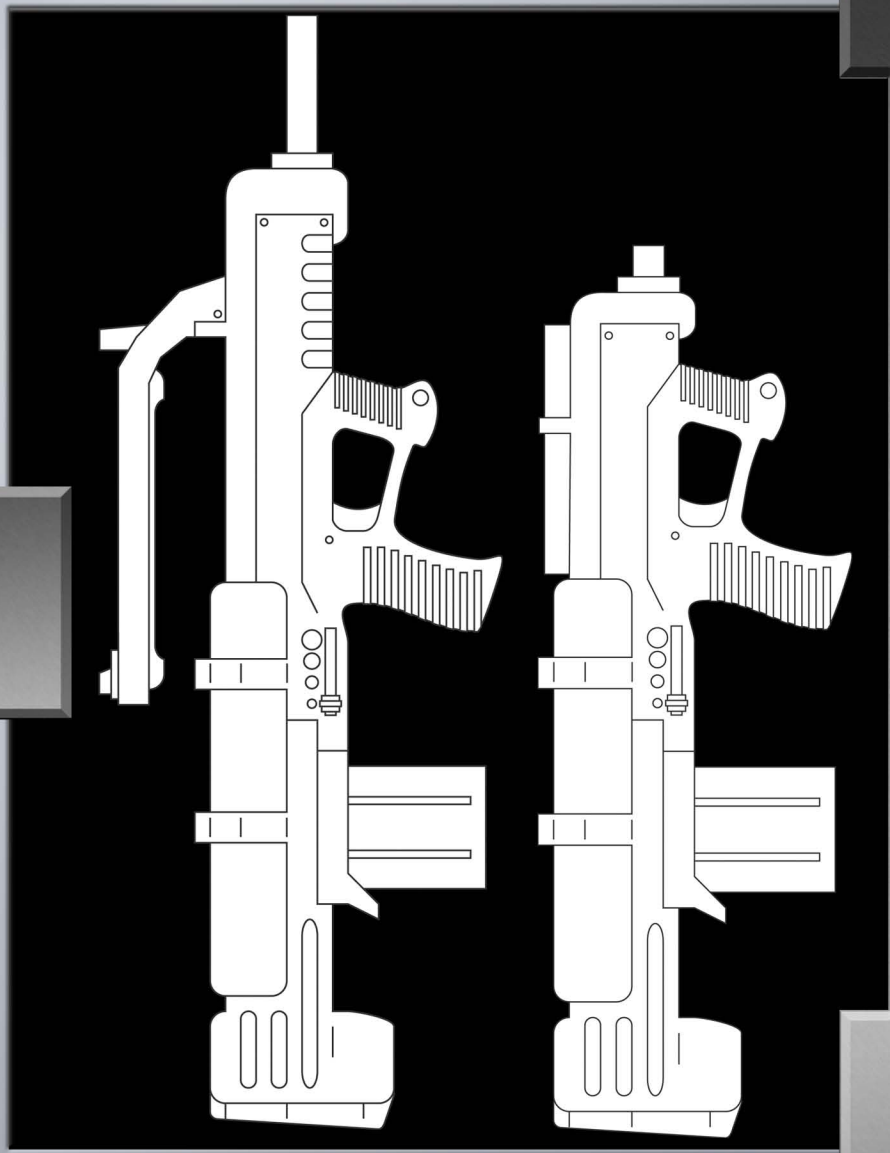
Progress Level 6
BPR-8 Weapon System

M Jason Parent

d20 system™

Dorland BPR-8
8mm Binary Propellant Rifle

Dorland Chem BPR
8mm Binary Rifle
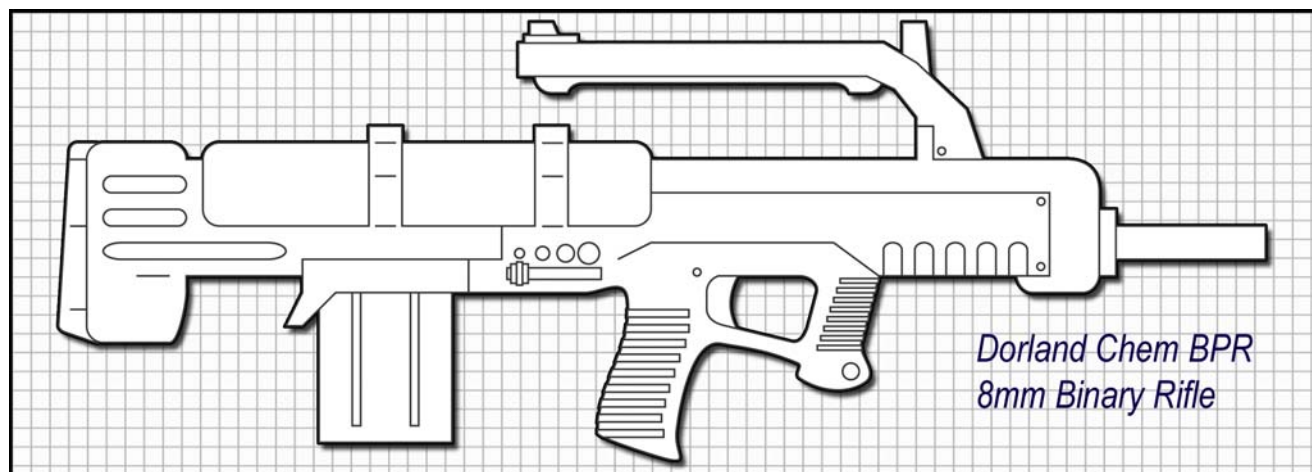
Dorland Chemical's BPR rifle system, designed in tandem with SIGarms, is considered to be the first successful Progress Level 6 binary propellant personal weapon system. Other binary propellant systems were developed leading up to the BPR-8, but most were plagued by reliability issues and controlled liquid injection problems.

At heart, binary propellant systems use a liquid propellant and an oxidizing solution that are kept separate until they are both introduced into the reaction chamber of the firearm to propel the bullet down the barrel. These systems have been used in artillery pieces effectively since the early 2010's, where the controllability of the quantities of propellant used provided for much simpler computer-controlled weapon ranging modifications. However, for use in personal firearms, the primary hurdle is the requirement for a three-part ammunition (the projectile, the fuel and the oxidant), all of which would be carried separately, and stocks of each would have to be maintained and monitored.

The BPR-8 system reduces the number of critical supplies by one third by using a standardized 8mm x 24mm projectile that is mated with the dry oxidant. The advantage of this system is the reduced number of components to be carried into the field by a soldier or other forces using the weapon system. However, this design uses the amount of dry oxidant required to fire the round at the maximum setting of the BPR-8 system. Whenever the weapon is used below this power level, some oxidant is not consumed and remains in the barrel of the firearm. Thus, this system is more prone to fouling than some earlier models, but is much simpler to load. Generally, the oxidant leftovers are insignificant, and routine cleaning is more than sufficient to maintain the BPR-8 system. The standardized round and oxidant combination allows the rounds to be used in all BPR-8 weapon systems – from rifles to submachine guns and even in the handgun model of the gun. By building the various firearms around the same bullet and propellants, there are no interoperability issues for troops and security forces equipped with a mixed range of handguns, rifles and subguns / carbines. The long round (24mm) has proven to be 'sloppy' when fired from short-barreled weapons, however this is rarely a problem as the instability of the round only truly becomes an issue at the extreme ends of pistol and submachine gun ranges.

The propellant-fuel is stored in state-of-the-art pressurized tanks. These tanks provide an even flow of liquid propellant regardless of angle of use, temperature, and motion. While bullet resistant, the tanks are still highly pressurized and vent out the liquid contents rapidly when punctured, usually tearing the gun from the grasp of the wielder. Older tanks also tend to spray the wielder and the nearby environment with the toxic propellant. The new tanks produced for the BPR-8 use permeable foam inside the pressure tank that prevents the full capacity of the tank from being vented immediately upon puncturing.
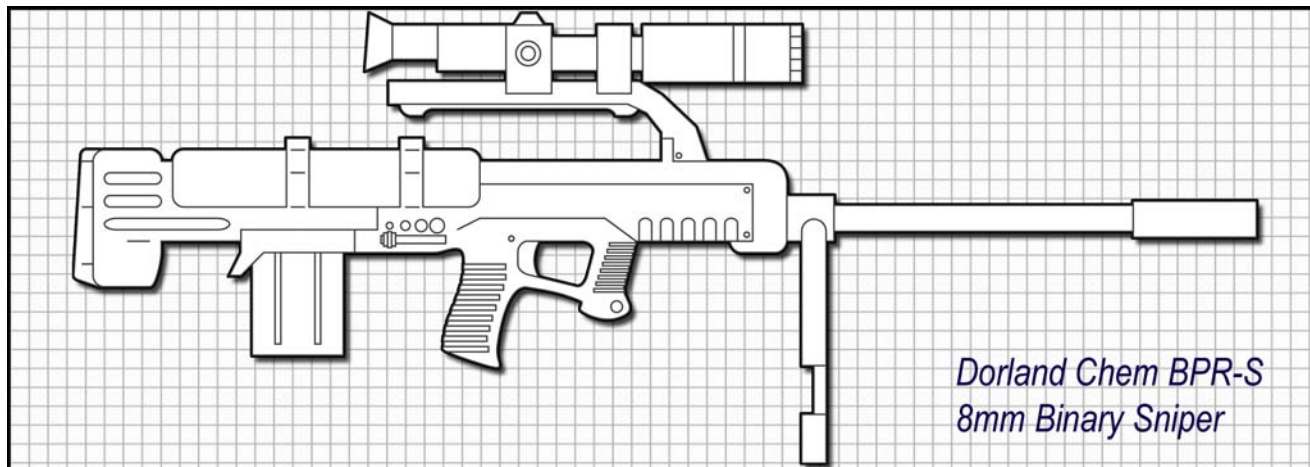
Dorland Chem BPR-S
8mm Binary Sniper

The biggest advantage of the BPR-8 system is the ability to set the amount of propellant used with each shot based on the requirements for the situation. For long-range and high-powered shooting, the maximum setting allows the 8mm round to strike with nearly the force of a classic .50 Browning Machine Gun round. Meanwhile, the firearm remains controllable for automatic fire at lower settings, and can even function subsonically at the lowest setting.

In addition, the initial pressure of the firing process is not as powerful as a conventional firearm, as the propellant is injected progressively as the round is propelled along, accelerating the bullet as it travels down to the end of the barrel. This allows models of the rifle with a very long barrel to fire at extremely high velocities without having to build up the strength of the receiver proper to handle the pressure spike of conventional ammunition.

The BPR-8 line is rarely the best weapon for any particular job or assignment, but is exceptionally versatile overall and capable of being used in situations ranging from urban warfare, to covert operations as well as battlefield conditions. The benefit of being able to carry a variety of weapon systems and yet only a single ammunition source can also be very important to some operations teams. The weapon system has proven to be successful with mercenary units as well as corporate security forces.

The BPR-8 Rifle

The core weapon in the BPR-8 line is the BPR-8 proper, a multi-role infantry rifle similar in design to most convention turn of the millennium assault rifles. The receiver appears to be a standard bullpup rifle holding the inner workings of the electronic binary system. The rifle weighs 12 pounds loaded, of which the propellant tank weighs in at a hefty 5 pounds. The tank is capable of powering the rifle for 500 shots at the lowest power level (see below). The main components of the rifle are made of high-impact polymers to keep the overall weight of the rifle at a bearable level. The trigger guard has been enlarged to work as a forward assault grip in addition to the forestock. The magazine is of typical size for an assault rifle magazine, but actually holds two full columns of 26 8mmD slugs, for a total of 52 rounds per magazine. The front of the forestock is mated to a single-point carrying handle which mounts the weapons iron sights and that is also used as a mounting point for optical accessories.

The BPR-8 is capable of firing at any of four different power levels, selected using the sliding selector switch above and behind the main pistol grip. At the lowest setting, the rifle is subsonic and very quiet. In this mode, the BPR-8 is capable of automatic fire at incredible accuracy because of the negligible recoil, although range is also fairly limited. At the second setting and third settings, the BPR-8 is an effective assault rifle. Setting two is still highly accurate for autofire, consuming three times the propellant as setting one. Setting three consumes four propellant charges and has the power of a light battle rifle. Setting four, which consumes six times the propellant as setting one, was designed for precision ranged fire, and as such cannot be used in autofire or burst fire modes as the weapon takes too long to cycle in this mode – while firing in this mode, propellant is continually fed into the reaction chamber until the round is nearly clear of the barrel, making it an exceptionally powerful and yet low-recoil setting.

d20 Rules: The BPR-8 gains a +1 equipment bonus on all attack rolls when used on settings one
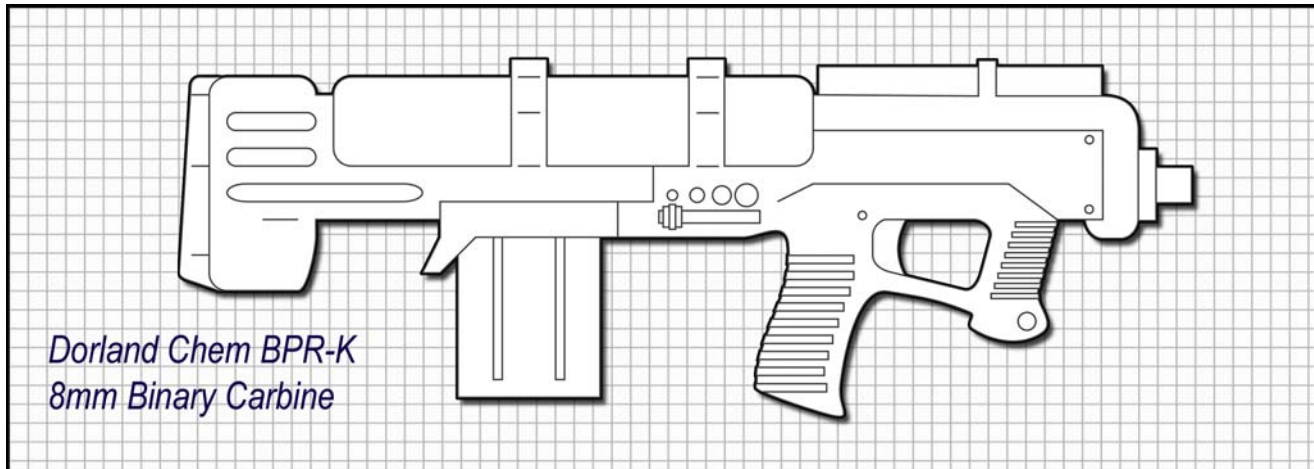
Dorland Chem BPR-K
8mm Binary Carbine

and two in combination with the burst-fire feat. Because of the low recoil of the binary propellant system, the BPR-8 is always considered a mastercraft weapon, and thus grants a +1 bonus on all attack rolls. In modes 1, 2 and 3, this weapon features a three-round burst setting. When the three-round burst mode is used with the Burst Fire feat, the weapon fires only three bullets instead of five and can be used with only three bullets in the weapon. On setting 1, the BPR-8 is a silenced weapon, a successful Listen check (DC 15) is required to notice the sound of the weapon firing.

The BPR-8S Marksman Rifle

An upgrade of the BPR-8 rifle design, the 8S is almost identical in design, but incorporates a much longer barrel and the injection system has been adjusted to take full advantage of this. The benefit of a longer barrel for the 8S is that a round takes longer to travel to the end of the barrel, thus giving more time for propellant to be injected into the combustion chamber to accelerate the round to higher velocities. The 8S uses the same 52-round magazines and 500 charge propellant canisters as the BPR-8 rifle.

The BPR-8S comes factory-equipped with a high-powered electronic targeting scope mounted on the carrying handle and completely removes the standard iron sights of the base design. Unlike the base rifle, the 8S is only capable of semi automatic and three-round burst fire, and then only in the first three firing modes. The first mode, which uses twice as much propellant as the similar setting on the standard rifle, remains sub-sonic and highly accurate. The second setting uses four propellant charges and is as capable as most modern battle rifles. Settings three and four automatically disable the three-round burst selector. The third setting uses six propellant charges and is the

standard sniper setting for the rifle. The fourth setting is designed for light anti-material roles or extreme range sniping, and uses ten propellant charges when fired.

d20 Rules: Due to the low recoil of the weapon, BPR-8S is always considered a mastercraft weapon, and thus grants a +1 bonus on all attack rolls. In modes 1 and 2, this weapon features a three-round burst setting. When the three-round burst mode is used with the Burst Fire feat, the weapon fires only three bullets instead of five and can be used with only three bullets in the weapon. On setting 1, the BPR-8S is a silenced weapon, a successful Listen check (DC 15) is required to notice the sound of the weapon firing.

The BPR-8K Carbine

In keeping with standard designs used in complete weapon systems worldwide, the designers at the Dorland SIGarms division made a compact carbine variant part of the BPR-8 family of weapons. The 8K uses the same magazines and propellant containers as the 8 and 8S weapons. The 8K Carbine is often described as a submachine gun, particularly in sales literature and SIGarms and Dorland Chemicals web sites. This is a misnomer, since it is still capable of firing rifle-powered munitions, unlike the BPR-8MP which is more of a true submachine gun design, but the 8K is definitely designed to operate in a similar role to the American M4 carbine, suited for close-in fighting where the larger 8 and 8S rifles would be more awkward. The carrying handle has been removed completely, and the forestock has been removed

Due to the shorter barrel of the 8K, the propellant injector settings have been reset to compensate for the

Dorland Chem BPR-8MP
8mm Binary Machine Pistol
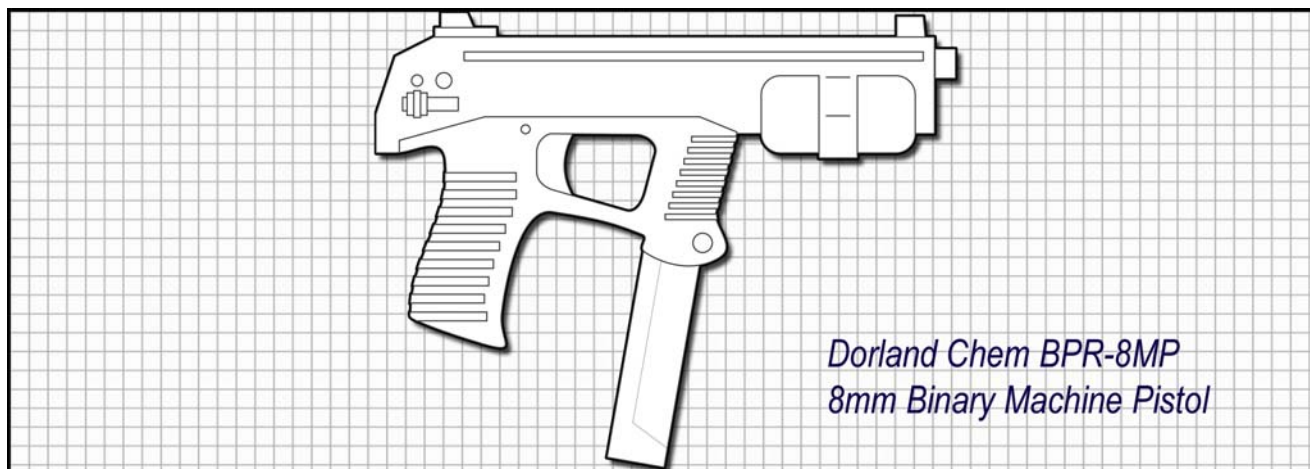
reduced space for acceleration. These settings inject the propellant more rapidly into the reaction chamber to allow for more rapid acceleration in the shorter barrel. The end result is the rifle has noticeably greater recoil and the receiver has been built up to withstand the greater firing stress. At the lowest setting, which uses a single propellant unit per shot, the 8K is silent and subsonic, as well as very accurate for burst fire. At the second setting, the 8K performs as a very accurate standard light submachine gun and uses two propellant charges per shot. At setting three, the 8K performs as a light assault rifle at a cost of three propellant charges per shot. On setting four, the 8K operates as a battle rifle, using four propellant charges per shot, although the recoil makes it significantly less controlled than the standard BPR-8 in this mode. Unlike the other rifle models, the 8K is capable of autofire and three-shot bursts in all fire modes.

d20 Rules: The BPR-8 gains a +1 equipment bonus on all attack rolls when used on settings one and two in combination with the burst-fire feat. Due to the low recoil of the weapon, BPR-8K is considered a mastercraft weapon when firing in modes 1, 2 and 3, and thus grants a +1 bonus on all attack rolls. In all modes, this weapon features a three-round burst setting. When the three-round burst mode is used with the Burst Fire feat, the weapon fires only three bullets instead of five and can be used with only three bullets in the weapon. On setting 1, the BPR-8K is a silenced weapon, a successful Listen check (DC 15) is required to notice the sound of the weapon firing.

The BPR-8MP Machine Pistol

A radical departure from the BPR-8 rifles, the MP and P models are complete redesigns using the same technology on a smaller scale. The assault grip in the enlarged trigger guard has been further enlarged to act as a magazine well that accepts a single-column 26-round box magazine of 8mmD binary slugs. Instead of placing the pressurized propellant canister behind and above the handle, a miniature 80 charge canister is inserted into the underside of the gun just ahead of the foregrip. (The charge capacity of the canister can be disconcerting, as the handgun uses half the propellant in a basic charge as the BPR-8 rifle does, thus the large capacity for such a small canister). The internal design is otherwise nearly identical to the BPR-8, but the injection system uses much smaller quantities of propellant to propel the 8mm slug down the short barrel.

Like the BPR-8 rifles, the machine pistol is a select-fire weapon, capable of operating in semi-automatic, three-round burst and full automatic modes, and works with two different propellant settings. On setting one, the gun is subsonic and silent and uses one propellant charge per shot. On setting two, the gun is comparable to a 10mm handgun and uses two propellant charges per shot.

d20 Rules: Due to the low recoil of the weapon, BPR-8MP is considered a mastercraft weapon, and thus grants a +1 bonus on all attack rolls. In all modes, this weapon features a three-round burst setting. When the three-round burst mode is used with the Burst Fire feat, the weapon fires only three bullets instead of five and can be used with only three bullets in the weapon. On setting 1, the BPR-8MP is a silenced weapon, a successful Listen check (DC 15) is required to notice the sound of the weapon firing.
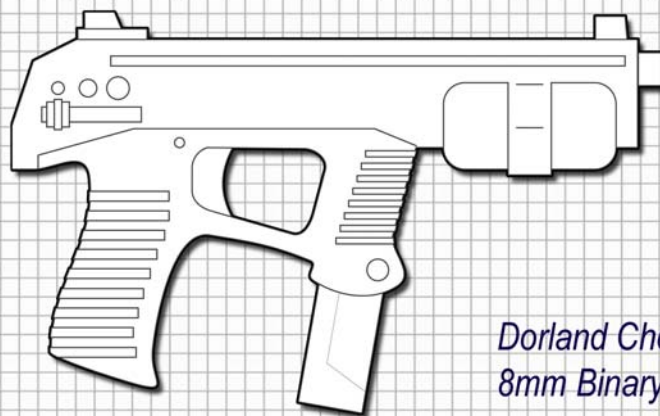
Dorland Chem BPR-P
8mm Binary Sidearm

The BPR-P Sidearm

A smaller version of the BPR-8MP, the BPR-P was designed to fulfill the role of a semi-automatic sidearm. As such, this is the only weapon in the BPR-8 firearm series that is not capable of autofire or three-shot bursts. In essence, the Model P is identical to the 8MP, but incorporates a third power level for more potent shooting at longer ranges or against hardened targets. The propellant canister is the same model as the one on the 8MP and holds 80 charges, although the magazine is a smaller box that holds only 16 rounds. On setting one, the gun is subsonic and silent and uses one propellant charge per shot. On setting two, the gun is comparable to a 10mm handgun and uses two propellant charges per shot. On the third setting, the gun performs similarly to a .50 Action Express and uses four propellant charges per shot.

d20 Rules: Due to the low recoil of the weapon, BPR-P is considered a mastercraft weapon, and thus grants a +1 bonus on all attack rolls. On setting 1, the BPR-P is a silenced weapon, a successful Listen check (DC 15) is required to notice the sound of the weapon firing.

8mmD Ammunition

The proprietary 8mmD ammunition has a purchase DC of 7 for a box of 100 rounds, and the propellant has a purchase DC of 7 for a 5 pound canister or DC 5 for a pistol canister.

Weapon	Damage	Crit	Type	Range	ROF	Mag	Size	Wt	Cost	Res
BPR-8 Mode 1	2d4	20	Ballistic	50 ft.	S,A	52 box	Large	12 lb.	22	Res (+2)
Mode 2	2d8	20	Ballistic	80 ft.	S,A					
Mode 3	2d10	20	Ballistic	80 ft.	S,A					
Mode 4	2d12	20	Ballistic	100 ft.	S					
BPR-8S Mode 1	2d6	20	Ballistic	60 ft.	S,A	52 box	Large	19 lb.	23	Res (+2)
Mode 2	2d10	20	Ballistic	90 ft.	S,A					
Mode 3	2d12	20	Ballistic	120 ft.	S					
Mode 4	2d12+2	20	Ballistic	140 ft.	S					
BPR-8K Mode 1	2d4	20	Ballistic	40 ft.	S,A	52 box	Large	10 lb.	22	Res (+2)
Mode 2	2d6	20	Ballistic	50 ft.	S,A					
Mode 3	2d8	20	Ballistic	60 ft.	S,A					
Mode 4	2d10	20	Ballistic	70 ft.	S,A					
BPR-8MP Mode 1	2d4	20	Ballistic	30 ft.	S,A	26 box	Medium	6 lb.	21	Res (+2)
Mode 2	2d6	20	Ballistic	40 ft.	S,A					
BPR-P Mode 1	2d4	20	Ballistic	30 ft.	S	16 box	Medium	5 lb.	21	Res (+2)
Mode 2	2d6	20	Ballistic	40 ft.	S					
Mode 3	2d8	20	Ballistic	50 ft.	S					

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