Paintball guns big 5

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(April 2009) (Learn how and when to delete this template message) A paintball marker and related equipment, including ammo and a protective mask A paintball marker, also known as paintball gun, paint gun, or just marker, is an air gun used in paintball shooting sport, and the main piece of paintball equipment. Paintball markers use compressed gas, such as carbon dioxide (CO2) or compressed air (HPA), to propel dye-filled gel capsules called paintballs through the barrel and quickly hit a target. The term marker is derived from its original use as a tool for forestry personnel to mark trees and ranchers to mark wandering livestock. [3] The snout speed of paintball markers is approximately 90 m/s (300 ft/s); most paintball fields restrict speed to 280-300 fps,[4] and small inner fields can further restrict it to 250 fps. [5] While higher snout speed is possible, unsafe use has been ruled out in most commercial paintball fields. [6] When paintballs hit an object at high speed they have the potential to cause damage; a paintball that collides with human skin, even protected with a cloth, can cause bruising or more tissue damage. However, the damage depends on the speed of the paintball, the distance, its angle of impact, whether it breaks and the part of the body it hits. Due to the possibility of serious soft tissue damage, paintball players should wear a quality paintball mask to protect their eyes, mouth and ears when barrel locking devices do not prevent paintball markers from firing. A good paintball mask is one that has a LENS coated with UV, fog, double panel, scratches and UV. Before making a purchase decision, the mask should be checked to check the comparability of the glasses, internal space and ventilation. Most of the paintball can be disassembled into four main components: the body, charger, barrel and air tank. Marker types Paintball markers fall into two main categories in terms of mechanism: mechanical and electropneumatic. Recognitions[edit] Mechanically works Spyder VS2 Paintball Marker Mechanically operated paintball markers work with exclusively mechanical means, and as such do not use electropneumatic solenoids controlled by an electronic plate to fire. there Main Mechanical Operating Methods: Pump or Bolt Action: The marker mechanism must be manually reset between each shot, similar to pump action shotguns and bolt action rifles. Markers of this type are the oldest used in the sport, since the first paintball game was played using the Nelspot bolt gun. [7] There are two main interior patterns on which most pump and bolt action markers operate: Sheridan Valve: Named after the Sheridan series of markers that first used this design, the markers that use this mechanism have the bolt that loads the paintball is located in a separate tube of the hammer and valve. To screw the mechanism, the bolt is pulled backwards, opening the chamber and loading a paintball. In doing so, it also pulls the hammer back against the main spring, which is then stopped by a fence connected to the trigger. The bolt is pushed forward, which loads the paintball into the barrel and the marker is ready to fire. Pulling the trigger releases the hammer that is propelled forward by the main spring, hitting the valve pin and opening the valve that allows the compressed gas to flow from the valve chamber into the barrel chamber thus propelging the loaded paintball forward and out of the barrel. The valve spring then closes the valve with the hammer still resting on the valve pin, after which this cycle must be repeated to fire another paintball. Notable examples of markers operating in this way include the Sheridan K2, worr Games Products Sniper and Chipley Custom Machine S6. Nelson Valve: Named after the Nelson Paint Company whose score, the Nelspot 007, used this mechanism for the first time. In such markers, the bolt, hammer and valve are located in the same tube. To screw the mechanism, the bolt is pulled backwards against the main spring to allow a paintball to fall into the gap, at which point the hammer bolted to the bolt with the main spring compressed between them. The bolt and the attached hammer are pushed forward to close the gap and load the paintball into the barrel, at which point the bolt can be activated by the trigger and the marker is ready to fire. Pulling the trigger disconnects the bolt bolt, allowing the main spring to propel the hammer backwards into the feed tube, thus opening the valve and allowing compressed gases to flow from the valve chamber to the barrel through the force tube and bolt that propel the charged paintball forward. The valve is then closed by the valve spring and the marker is ready to be re-cocked for the next socket. Examples markers using this mechanism are the Nelson Nelspot 007, the CCI Phantom and the Redux. Hybrid Sterling Valve: A variation or bybrid of these two methods of operation has been used in the design of the Arrow Precision Sterling, in which the bolt is in a separate tube, as in a Sheridan valve marker, the hammer is blocked to a carrier similar to how it would do with the in a Nelson valve design, and when released it hits a Sheridan-style pin valve. There is significant debate as to what type of operations sterling employs, as some consider it to be a hybrid between the two main designs, and others simply consider it to be a stacked tube Nelson. [8] Double Action: The marker's firing mechanism triggers and restarts the firing mechanism, similar to the way a dual-action revolver works. Examples include the Line SI Advantage, the NSG Splatmaster Rapide and the Brass Eagle Barracuda. Semi-Auto Recoil: The marker mechanism is used cycle using gases released by the valve that reset the firing mechanism between each shot, similar to the way some semi-automatic rifles like the AK-47 work. The inside of the recoil-operated markers can be in line, with the bolt, valve and hammer aligned along the same shaft, such as the Tippman 98, or a tube stacked with the bolt in a separate hammer and valve tube like the King-man Spider. Blow Forward Semi-Auto: The marker trigger mechanism works by using the gases stored in the valve to turn on the bolt and fire the paintball, after which a spring restarts the mechanism for the next shot. Notable examples include the Air-gun Designs Auto-mag, Tippmann X-7 Phenom and the Tiberius Arms T8. Semi-automatic pneumatically operated: A low-pressure pneumatic piston controlled by a four-way valve connected to the trigger restores the firing mechanism between shots, and can be considered as semi-automatic conversions of markers that would otherwise be the action of the pump or bolt. Notable examples include the WGP Autococker, Palmer's Pursuit Shop Blazer and Typhoon. It operated electropneumatically The Planet Eclipse Ego, an electropneumatic paintball marker In electromagnetic designs, the trigger, instead of being mechanically linked to the action of the marker, simply activates an electronic microswitch (or more recently, a magnetic or optical sensor). This information is passed through control circuits to a computer-controlled solenoid valve that can be opened and closed very quickly and accurately, allowing the gas to enter or exit several pressure chambers on the marker to move the bolt and fire the paintball. This trigger disconnection from the action allows the electronic trigger handles to be very short in length and very light (similar to a mouse click; the mechanisms are virtually identical), dramatically increasing the rate of fire over a fully mechanical design. Solenoid-controlled gas valve designs also reduce the weight of internal parts, lightening the total weight and reducing the time it takes for the marker to travel a single ball Recognitions[edit] Each branch favors a different aesthetic and values different aspects of marker design. Recognitions[edit] Body of the marker A player who uses a Spyder paintball marker Most of the functions and aesthetic characteristics of the marker are contained in his body, which contains the trigger mechanism: the trigger frame, bolt and valve. Most paintball marker bodies are constructed of aluminum to reduce marker weight, and feature custom milling and color anodizing. External design The biggest external and ergonomic difference in marker bodies is in the trigger and barrel position. Expensive model designers attempt to position the trigger frame forward toward the center, or slightly forward from the center of the body on speed-oriented markers. This allows the HPA tank to be mounted in a position that allows compactness and balance without the need for additional modifications that allow the tank to fall off and advance. Such forward descent from the aftermarket, can create a larger gun profile, which can result in removals due to hopper blows. Users often modify less expensive markers to allow a similar mode of operation, albeit by sacrificing a low profile. Although this is not important in games where team successes are not counted, in most games, including wooden ball games, hopper hits are counted as a elimination. Some markers mount the barrel further back into the gun body to preserve a compact design, sacrificing the positioning of the trigger forward on the body of the marker the entire body of the paintball gun should have to clean properly for its best response Paintball markers are also rated to a lesser extent by which the paintball play style in which they are intended for use – sports paintball like Speedball and Stock Class Paintball, or military simulation style games like Woodsball. Triggers are the player's primary means of interacting with the marker. The amount of force required to fire the marker, as well as the distance the trigger travels before triggering, called launch, has a marked effect on the player's ability to achieve high fire rates. Many markers, especially higher-priced markers, use electronic trigger frames with a variety of detection methods, including microswitches, hall effect sensors, or infrared break beam switches. These triggers have short shots, allowing for a high rate of fire. Non-electronic markers are sometimes carefully used to achieve a light and short trigger pull. The trigger frame on non-electronic mechanical markers simply uses a series of springs and levers to release a cerer, which propels the hammer into the body forward. In electronic markers, the trigger box houses the electronics that control the solenoid, as well as features such as Enhanced circuit boards that add enhanced features are available. Bolt and valve assembly The bolt and valve assembly is the mechanism that triggers the marker. The valve is a mechanical switch that controls whether the marker is firing or not. The bolt directs airflow and controls the entry of paintballs into the chamber. The bolt and valve can be separate components, as in many electromagnetic markers based on blowing and poppet. Alternatively, the valve may be incorporated into the bolt, bolt, electromagnetic coil valve markers. A typical paintball gun in a full disassembly state (except for trigger work). Most modern markers have an open bolt design. When the marker is at rest, the bolt is in the rear position, and the firing chamber is exposed to the pile of paintballs that is fed by the charger. Some markers have closed bolt designs; in the resting position, the bolt, and the paintball to be fired, are forward and the feed stack closes from the camera. Closed bolt markers were thought to be more accurate because there is no reciprocal mass when the marker is triggered. However, tests have shown that the position of the bolt has little effect on the accuracy of a marker. [9] Bolt and valve on mechanical markers Most mechanical markers employ a simple recoil design using a poppet valve (also known as a pin valve), which opens when hit by a compression force, provided in the form of a spring-propelled hammer. This type of marker usually uses a stacked tube design, in which the valve and hammer are located in the lower tube, while the bolt, which is connected to the hammer, is in the upper tube. When the hammer is pulled back, the inner spring compresses, exerting exponential pressure against the continuous backward movement of the hammer. As the hammer and spring mechanism reach the far end of its backward travel range, it is captured and locked in place by a metal capture device known as the sear. The bristle holds the hammer in place, allowing the kinetic energy of the forward movement of the bolt to be released each time the bolt is depressed. As the trigger is pulled, the bristle is depressed and allows the hammer to be propelled forward by the spring. The hammer collides with the valve releasing gas from the external pressurized tank into the internal bolt chamber. The subsequent burst of gas channels at the front of the bolt, propelling the paintball through the barrel. The rest of the gas pushes back over the hammer, pushing both it and the bolt back until the mechanism is trapped once more in the bolt. Once captured, the hammer is ready to repeat the recoil process. In cases where the storage vessel pressure drops below the minimum required to complete the action cycle, the marker can escape by firing quickly without the need for additional trigger shots. Poppet valves are easy to replace and require little maintenance. The disadvantage of this design, however, is its high operating pressure, which leads to a larger recoil and less precision. Awards and recognitions[edit] Markers have a separate firing and recocking sequence, which decreases the recoil caused by the hammer cycle. Recognitions[edit] Markers with a hammer have a firing delay compared to a complete electropneumatic. Awards[edit] Some markers are a hybrid of mechanical and electronic characteristics. In these markers, the hammer and spring continue to activate the valve, but the hammer is released by a solenoid in a shooting frame. Bolt and valve in electropneumatic markers Instead of the spring and hammer used to operate the valve and bolt assembly cycle on mechanical markers, electropneumatic markers use air redirection to different places on the marker. This redirect is controlled by a solenoid that is triggered by the trigger. The two types of bolt and valve mechanisms in the electropneumatic markers are the poppet valve and the coil valve. Electropneumatic markers based on poppet valves are very similar to mechanical recoil markers. These pave a stacked tube construction, built around a poppet valve, which opens when hit by a force. While mechanical markers provide that force with a spring-propelled hammer, the valve on the poppet-Ealve markers is activated by a pneumatic ram. The bolt is connected to the ram. Poppet valve markers have several disadvantages compared to coil valves: external moving parts, higher pressure needed for the poppet to seal, a reciprocal mass and a stronger trigger signature. However, they are generally also more gas efficient than coil valve models because the poppet valve opens quickly and places air in the firing chamber faster. Examples of markers using this mechanism are the WDP Angel, Planet Eclipse Ego, Bob Long Intimidator and Bushmaster. [10] In electropneumatic markers based on coil valves, the bolt also acts as the valve. This eliminates the need for a stacked tube construction; Coil valve markers have a more compact profile. Instead of a cycling hammer or ram hitting a pin valve, bolt movement is controlled by air routing in small chambers in front of or behind the bolt. An air tank behind the bolt contains the air that should fire the paintball. When the marker is at rest, air is routed to the front of the bolt to prevent air from escaping from escaping. In an unbalanced coil valve design, when the trigger is pulled, that air runs out of the marker, allowing the air in the tank to push the bolt forward. In a balanced coil valve design, the air in the tank cannot force the open bolt; Instead, the air at the front of the bolt is redirected to a small camera behind the bolt, separated from the tank, which then pushes the bolt forward. In any case, the forward bolt movement exposes the tracks on the bolt or marker that allow air in the tank behind the bolt to de-ion to the front and fire the paintball. The airflow to the front of the bolt is then restored, pushing the bolt to his resting position. A typical coil valve has at least one O-ring that undergoes a shear and compression duty cycle for each socket, leading to faster wear and less reliability. In addition, smaller valve openings and longer opening times make them less gas efficient than their poppet valve counterparts. Since coil valve markers have reduced the reciprocal mass and can operate at lower pressures, they have less recoil and a sound signature. Examples of markers that use this mechanism are the dye matrix, Smart Parts Shocker, Smart Parts Ion, and MacDev Clone. [11] Adjustment of the bolt and valve system In mechanical and poppet-based electropneumatic markers, the valve is generally designed to accommodate a specific operating pressure. Low pressure valves provide quieter operation and greater gas efficiency when adjusted correctly. However, excessively low pressure can decrease gas efficiency as dramatically as excessively high pressure. In addition, the valve must be fixed to release enough air to fire the paintball. If the valve is not tuned correctly, insufficient air to fire the paintball can reach the bolt. This phenomenon, known as takedown, causes shooting paintballs to gradually lose range, and can also occur at high fire rates. Some markers have integral or external chambers, called low pressure chambers, which maintain a large volume of gas behind the valve to prevent knockdown. Tuning can also prevent air from exploding the feeding tube when firing, interrupting the feeding of paintballs on the marker. The magazines, commonly known as hoppers, hold paintballs so that the marker fires. The main types are gravity feeding, agitation and force feeding. Stick feed is also used to hold paintballs, although they are not considered hoppers. While shaking and feeding the force of the hoppers facilitate a higher rate of fire, they are subject to battery failures as well as degradation if they come into contact with moisture. Such hoppers that are not equipped with photoreceptors are prone to problems with ball breaks. When a paintball filters paint into the hopper from a break in the hopper, the gelatin shells of the paintballs can deteriorate, causing them to stick together, as well as jam in the barrel. Stick feed stick feeds are mainly used in pump and stock class markers. They consist of simple tubes that hold between ten and twenty paintballs. Stick feed is usually parallel to the barrel; player must tilt the marker to load the next paintball. Some stick feeds are vertical, or inclined to facilitate gravity feeding, although this contravies accepted stock class guidelines. Gravity feeding Gravity feeding is the simplest and cheapest form of hopper available. Gravity feed hoppers consist of a large container and a molded feed tube at the bottom. Paintballs roll down the sloping sides, through the tube and towards the marker. These have a top speed of 11.6 balls per second. Gravity feed hoppers are very cheap, as they are made of only a shell and a lid, but can be easily jammed as paint balls accumulate above the tube. Rocking the marker (and hopper) occasionally can prevent paintballs from jammed in the hopper. This problem is compounded when a fully electronic marker is used. Most mechanical markers use a recoil system for reaming, or other methods where a large reciprocal mass is involved. This will shake the balls in the hopper facilitating gravity feeding. An electronically controlled reaming and shooting marker may not show any movement during operation. Because of this, the small packages in the hopper do not break and the feeding problems result. There are also magazines that resemble military sights that mimic an ACOG or a Red Dot sight, with 20 capacity balls at 10 balls per second. It is typically used in milsim events or lowcap events (for example: each player can use a maximum of 50 paint balls). Agitating Agitating hoppers use a propeller, rotating inside the container, to shake the paintballs. This prevents them from jammed in the feeding neck, allowing them to feed faster than gravity feeders. Older tournament-level hoppers are the stirrer type, as the highest rate of fire requires a reliable hopper. There are two types of stirring hoppers: those that have sensors, called eyes, and those that don't. The eyes consist of an LED (light-emitting diode) and a photodetector, typically a phototransistor or photodiode, inside the neck or hopper tube, to detect the presence of a ball. In a hopper, the eyes detect when a ball is absent, causing it to rotate. Shaking eyeless hoppers will quickly deplete batteries and can bend or dent paintballs, causing a short, less efficient injection of air, sesaking. Shaking hoppers with eyes will only rotate in the absence of a ball, avoiding damage and prolonging battery life. A third type of stirring hopper, the cyclone feed system manufactured by Tippmann, reroutes the gas to shake the feed mechanism. You don't need batteries to operate. Power hoppers use a impeller to capture paintballs and force them into the marker. The impeller is spring-operated or powered by a belt system, allowing you to maintain constant pressure on the paintball stack in the feed tube. This allows force feed hoppers to feed paintballs at a speed of more than 50 balls per second, as the mechanism does not depend on gravity. Power hoppers are the dominant type used in tournaments, being the only type of charger capable of maintaining the high rate of fire of the electropneumatic markers. Some markers use force-fed magazines in the form of firearm magazines. These are preferred when a low profile is required, as in wooden ball sniper positions. Even more unusual are fully contained chargers, which incorporate both a propellant gas source and force-fueled paintballs. The latest type of power supply hoppers communicate wirelessly with marker electronics using This allows the hopper to start feeding paintballs before the marker's pneumatic system has started rolling the next shot. This system almost completely eliminates power errors and can increase charger speed and battery life because the charger is only in operation when the marker is preparing to fire. Propulsion system A CO2 tank Main article: Paintball equipment - Thrusters The tank contains compressed gas, which is used to propel propel paintballs through the barrel of the marker. The tank is usually filled with carbon dioxide or compressed air. High pressure air (HPA) is also known as nitrogen, as the air is 78% nitrogen, or because these systems can be filled with industrial nitrogen. Due to carbon dioxide instability, HPA tanks are required for constant speed. Other propulsion methods include the combustion of small amounts of electromechanically operated propane or spring-plunger combinations similar to those used in an airsoft pistol. Carbon dioxide Carbon dioxide (CO2) is a propellant used in paintball, especially on cheap markers. It is usually available in a 12-gram powerlet, mainly used in stock paintball and paintball guns, or a tank. The capacity of a carbon dioxide tank is measured in ounces of liquid and filled with liquid CO2, at room temperature the vapour pressure is approximately 5,500 kilopascales (800 psi). CO2 liquid must be vaporized into a gas before it can be used. This causes problems such as inconsistent speed. Cold weather can cause problems with this system, reducing steam pressure and increasing the chance of liquefied gas docking in the marker. Low-temperature liquid can damage internal mechanisms. Antisyphron tanks have a tube inside the cylinder, which is bent to prevent liquid carbon dioxide from being extracted into the barrel. On the other hand, a series of paint guns were designed with specific valves to operate with liquid CO2, including some early Tippmann models and the Montneel Mega-Z, thus solving the problem caused by phase changes. [12] CO2 tanks equipped with Siphon are easily identified by the clumsy sound their weight makes when the tank is tilted. After many years of use, carbon dioxide has almost been universally replaced by high-pressure air systems (see below) High-pressure air high-pressure air, compressed air or nitrogen, is stored in the tank at a very high pressure, typically 21,000–31,000 kPa (3,000–4,500 psi). The output is controlled with an attached regulator, regulating the pressure between 1,700 kPa (250 psi) and 5,900 kPa (860 psi), depending on the type of tank. The advantage of using carbon dioxide (CO2) regulated HPA is the consistency of pressure and temperature stability where CO2 reacts to temperature changes causing inaccuracy and freezing during intensive use. The most popular tank size is 1,100 cubic centimeters (67 cubics) to 31,000 kPa (4,500 psi) providing 800-1100 shots. HPA tanks are more expensive because they must accommodate very high pressures. They are manufactured as steel tanks, aluminum or wrapped carbon fiber, the latter being the most lighter. Most players with electronic markers use HPA because if CO2 is used, the marker's electronic solenoid valve can be damaged if liquid CO2 enters. Users are cautioned not to place any lubricant in the filling nipple port of an HPA tank, as oil may burn when subjected to highly compressed air, causing it to cause like a diesel engine. Propane A much less common propellant is propane, which appears only on the Tippmann C3. Instead of simply releasing gas as in high-pressure air and CO2 markers, propane is ignited in a combustion chamber, increasing pressure and opening a valve that allows the expanding gas to propel the paintball. There are a number of advantages, mainly shots per tank, ranging from 30,000 to 50,000 shots (depending on tank size) compared to the typical 1000 to 2000 shots that are standard with high pressure air tanks or CO2. Another benefit includes availability, as propane is readily available in many stores, while CO2 and high-pressure air are most often filled with compressors or preloaded tanks, which are less common. It can also be considered safer as well, because a typical high-pressure air tank maintains air at 21,000-31,000 kPa (3,000-4,500 psi), and a CO2 tank at 5,500 kPa (800 psi), but propane is stored at 2,100 kPa (300 psi0). However, propane produces heat, which (when fired for an extended period of time at high rates of fire) can cause burns if handled incorrectly. It can also be a fire hazard: the Tippmann C3 releases small amounts of flames from the vents in the combustion chamber and out of the barrel when firing. If a marker develops an incorrect maintenance leak, it could cause a fire. Gas control marker systems have a variety of regulator configurations, ranging from fully unregulated systems to high-end systems using four regulators, some with multiple stages. The regulatory system affects both accuracy and firing speed. Carbon dioxide regulators should also prevent liquid gas from entering the marker and expanding, causing a dangerous wave of speed. Regulators used with carbon dioxide often sacrifice performance and accuracy to ensure the marker works safely. HPA-only regulators tend to have extremely high performance and are designed to ensure uniform pressure between shots to ensure marker accuracy at high firing speeds. Tournament scorers are usually equipped with two controllers and another in the tank, each with a specific function. The tank regulator reduces air pressure from 21,000–31,000 kPa (3,000-4,500 psi) to 4,100–500 kPa (590-800 psi). A second regulator is used to further reduce this pressure near the firing pressure. This reduction allows for greater consistency. The air is then supplied to a regulator in the marker body, where the final outlet pressure is selected. This can be between 5,500 kPa (800 psi) for markers of fully unregulated at approximately 1,000 kPa (150 psi) for extremely low pressure markers. After the firing pressure is decided, tournament-oriented markers use another regulator to supply gas to a separate pneumatic system, to power any other functions, such as bolt movement. This is an extremely low pressure

regulator, extremely low, usually below 690 kPa (100 psi). Barrels The barrel of the marker directs the paintball and and releasing the gas bag behind it. Several different hole sizes are made, to suit different paintball sizes, and there are many lengths and styles. Most modern paintball markers have barrels that are screwed into the front receiver. Older guys slide the barrel and screw it into place. The barrel threading must match that of the marker. Common threads are: Angel, Autococker, Impulse/Ion, Shocker, Spyder, A-5 and 98 Custom. Barrels are manufactured in three basic configurations: one part, two parts, and three pieces. A barrel with interchangeable holes, with two or three pieces, is called a barrel system, rather than a two- or three-piece barrel. This avoids confusion, as many two-piece barrel systems do not use an interchangeable hole system. One-piece barrels are machined from a single piece of material, usually made of aluminum, but stainless steel has been historically popular. Paintballs can range from .50 gauge to .695 (12.70-17.65 mm), and barrels are made to match these diameters. Some one-piece barrels have a stepped hole that increases from their nominal hole size to around the .70 caliber (17.78 mm) after 8 inches (200 mm). One-piece barrels are generally less expensive to produce and therefore buy, but if you want a different hole size (for a fit closer to the size of a given brand or batch of paint balls) a completely new barrel is required. The use of a single material for the entire barrel means that the disadvantages of certain materials, such as durability (aluminum) or weight (stainless steel), cannot be mitigated. Two-piece barrels consist of a front and rear. The back is joined to the marker and machined with a hole specified between the caliber .682 and .695 (17.32-17.65 mm). The front makes up the rest of the length and contains portability. The fronts usually have a larger hole than the back. The design of a two-piece gun allows the use of more than one back with a front, to change the effective size of the barrel hole without changing the entire barrel. It also allows the back to be made of a different material, that is, of a different color, than the front, allowing aesthetic and performance customizations. Three-piece barrels have only one back. A series of inserts, or sleeves, with different holes are inserted into the back. The front is attached to hold the sleeve in place. Sleeves are usually offered in aluminum or stainless steel. Aluminum sleeves are lightweight but can be easily sharpened or scratched; Stainless steel versions are stronger, but carry a weight penalty. The user only needs one sleeves and a back for each marker. The front sections, which adjust the length of the barrel, can be swapped. This type offers the widest selection of barrel diameters, usually .680 (17.27), .681 (17.30), .682 (17.32), .683 (17.35), and up to .696 caliber (17.68 mm). Length Typical barrels are between 76 mm (3.0 in) and 530 mm (21 in) long, although custom barrels can be up to 910 mm (36 in) long. Long. barrels are generally quieter than shorter barrels, allowing excess gas to escape slowly. Players typically choose a gun length between 300 mm (12 in) and 410 mm (16 in), as a compromise between accuracy, range and portability. Many players prefer longer barrels, as they allow them to set aside the large inflatable bunkers commonly used in paintball tournaments while still behind the deck. Most barrels are ported or ventilated, which means that the holes are drilled at the front of the barrel allowing the propellant to slowly dissipate, making the marker quieter. Portability in the first 200 mm (7.9 in) of the barrel length decreases the gas efficiency of a marker. For example, if a 410-millimeter (16-inch) gun has a high portability that starts 150 mm (5.9 inches) beyond the wires, the ball must travel the other 250 millimeters (9.8 inches) largely in its own impulse, losing speed (due to friction) rather than gaining more speed due to continuous air pressure. Compensating for this requires a higher burst of gas, decreasing efficiency. Carrying too early can also dramatically increase noise, as the gas is still under a significant amount of pressure. Hole The hole is the inner diameter of the barrel. The hole must correctly match the type of paint being fired, the most critical aspect of a barrel. A mismatched selection will result in speed variations, causing difficulty maintaining a close match to field rate limits and in extreme cases can affect accuracy. Two- and three-piece barrels allow the barrel hole to adapt to the diameter of the paint without the need for new barrels. Correct matching is especially important in closed bolt markers that lack ball holds because the ball will roll down, and potentially out of, the barrel. This results in a dry fire in case the ball fell off the barrel, or a lower-speed shot. It has been shown that the hole to match the paintball size is less efficient. The suborder (the barrel gets smaller than the diameter of the paint) results in good consistency and efficiency of the shot. Overbing (the barrel gets larger than the diameter of the paint) results in good intake consistency, but worse efficiency. The combination of barrel paint does not produce an increase in the consistency or efficiency of the shot. [13] Shooting and trigger modes Since the advent of semi-automatic markers in the early 1990s, both insurance and competition rules have specified that markers should be semi-automatic only; it's just shoot a paintball by trigger shot. While this was a perfectly clear definition when all markers were based on mechanical and pneumatic designs, the introduction of electronically controlled markers in the late 1990s meant that technology had allowed for easy circumvention of this rule. Electronic markers are often controlled by a programmable microcontroller, in which any software could be installed. For example, the software may allow the marker to fire more than once per shot, called a shooting ramp. Speeding up is an electronic shooting mode in which The fully automatic firing speed will be activated as long as the player maintains a low rate of trigger shots per second. Pump Action Pump action markers must be manually repositioned after each shot, as must a pump action shotgun. Some bomb action paintball markers such as the Sterling and many Nelson-based markers such as the PMI Tracer and CCI Phantom offer slam-fire action, also known as an automatic trigger, which occurs when the trigger is pulled and the marker is triggered with each re-grip of the marker through the pump. [15] Semi-automatic semi-automatic markers use a variety of designs to automatically travel a bolt and load a new paintball into the chamber with each trigger. This frees the player from manually pumping the marker, allowing him to increase the rate of fire. Semi-automatic markers can have a mechanical trigger or electronic trigger frame. An electronic trigger frame typically has a lighter trigger pull and less space between the trigger and the pressure point, allowing the player to fire at higher fire rates. These frames are commonly available as fully mechanical marker upgrades, or are integrated into the design of electropneumatic markers. With the popularity of electronic trigger frames that allow players with such frames to achieve very high fire rates, tournament leagues began to put limits on the maximum rate of fire of electronic markers used in their events. Manufacturers also often set their own limit on the maximum fire speed that the marker will support, to ensure reliable cycling. These limits are called limits; Tournament caps usually range from 12 to 15 balls per second, while mechanical caps vary depending on the marker design and firmware used. If such a stop is applied, the marker will prevent a ball from firing less than a certain time after the last one, the time delay resulting in the desired maximum firing speed. A trigger extraction that occurs before this time has elapsed will be queued, and the marker will fire again after the delay, but most markers will limit the number of shots that can be queued to prevent the marker from firing a series of shots after the trigger was last pulled , a so-called leak marker. Fully automatic markers are continuously activated when the trigger is pressed. The Tippmann SMG 60 was the first fully automatic paintball marker. Most electropneumatic paintball guns[16] feature this mode. Fully automatic mode can be added to any electropneumatic marker by installing a logic board or buying a completely new electronic shooting frame. Similarly, markers can be equipped with burst modes. These modes, ranging from three to nine bursts of fire, allow the player to make accurate shots with a quick pull of the trigger, using more than one ball to increase their chances of hitting the target. In burst mode, the rate of fire can be equal to that of fully automatic mode, which is useful in short-distance situations. Ramping Ramping is a on some electronic markers that automatically change the fire mode from semi-automatic to fully automatic under certain conditions; [17] Usually on a certain number of rapid shots being fired or a minimum rate of fire reached and sustained. The ramp can be difficult to detect because ramp modes can be used inconsistently. Ramp modes can be further hidden in the software, ensuring that a marker will fire in a legal semi-automatic mode when tested, but an illegal ramp mode can be activated by the player under certain conditions. Some leagues allow a specific ramp mode to prevent problems with the app, and to provide more level playing conditions with respect to technical skill and score quality (and price). The rule specifies a minimum time between shots that results in a maximum rate of fire, and that a certain number of semi-automatic shots must be fired before the ramp can be activated. With players constantly using a standard ramp mode, players using a different mode are more easily detected. The rate of fire is applied by a PACT timer, a standard firearm timing device that measures the time between shots. The following are common league-specific ramp modes, preset in the marker firmware: PSP Ramping – Ramping starts after 3 shots; the player must keep at least one tug per second to achieve/maintain the ramp. The marker can then fire up to (and no more than) three balls per trigger shot in a trapped manner. The rate of fire cannot exceed 12.5 balls per second (as of 2011), even if the player pulls the trigger 5 times per second or faster. NXL Ramping – Ramping begins after three shots; the player only has to hold down the trigger to keep the fire fully automatic. The rate of fire cannot exceed 15 balls per second. The shot must cease immediately after the trigger is released. Millennium Ramp – Ramping starts after six trigger handles at a minimum speed of 7.5 pulls per second; the player must hold 7.5 trigger shots per second to maintain the ramp. The rate of fire cannot exceed 10.5 balls per second. When the player stops pulling the trigger during the ramp, no more than one extra ball can be fired after the last pull. See also the list of paintball team paintball gun paintball stock paintball markers References Why paintball Guns are called markers?. Retrieved 9 March 2019. SPLAT!; South Sound hosts some of the best in the world of Paintball. Tribune News, El. Archived from the original on 15 July 2011. Retrieved 15 September 2009. Gaines (December 6, 2004). Who thought it was a good idea? Cnn. Archived from the original on June 4, 2011. 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